ASD AND BEHAVIOURAL INTERVENTIONS: AN INTRODUCTION FOR SCHOOL PERSONNEL: AN EXTERNAL REVIEW

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ABSTRACT

This study encompasses an external program review of *ASD and Behavioural Interventions: An Introduction for School Personnel* (*ASD & BI*), an online course distributed through the New Brunswick Department of Education and Early Childhood Development. The course is designed for educational professionals who seek additional training on autism spectrum disorder and appropriate interventions. This study focuses on the province of New Brunswick only. Sixty participants were included, and data collection occurred from November 2017 until April 2018. The participants completed pre- and post-test survey questionnaires at the start and finish of the course and a brief post-test short answer questionnaire. This information provided the data necessary to address the overarching research questions: How effective is *ASD & BI* perceived to be by participants? What is perceived as working well and what do participants perceive as not working? And, what is the typical demographic of participants who enroll in the course? The Wilcoxon Signed-Rank test showed that there were significant differences between the pre- and post-test results ($p<0.001$), indicating a likelihood that completion of the course had resulted in significant changes in participants' perceived competency of ASD.

Five themes emerged through the qualitative short answer responses which were expanded on and utilized to develop four recommendations for future disseminations of *ASD & BI.* The small sample size and homogeneousness of the participant demographics suggests that the results of this review should not be generalized as the experiences of all professionals who enroll in the course but is a relevant to the immediate context of the

current study. Additional reviews should be considered in the future, specifically those that include Newfoundland, Nova Scotia and Prince Edward Island.

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Table of Contents

List of Tables

List of Figures

List of Appendices

Chapter One: Introduction

Background and Overview

ASD and Behavioural Interventions: An Introduction for School Personnel (*ASD & BI*) is an online training program (offered in both English and French) through the New Brunswick Department of Education and Early Childhood Development. The course can be accessed through the University of New Brunswick *Desire 2 Learn* software. It launched in April 2015 and is presently still offered. It is designed for all educational personnel including teachers, school administration, educational assistants, speech-language pathologists, and psychologists who wish to acquire additional knowledge and skill sets surrounding autism spectrum disorders (ASD) and appropriate, evidence-based interventions that may be used to support such students. The course is divided into ten learning modules and is intended to be self-paced, with a total time allocation of approximately 40 hours. The modules contain text, video, case stories, and self-assessments that end each module, in addition to an evaluative post-test survey. This training program was developed as a response to the increasing need for professional growth and training in the fields of ASD and behaviour within the Atlantic Provinces (Maich, 2015).

This study examines participants' attitudes towards the course, perceived competency supporting individuals with ASD within learning environments, and knowledge of ASD across the timeline of the course. The main focus of data analysis was to determine if differences could be found between participants' comfort levels with various skillsets such as identification, the impact of ASD on learning, knowledge of evidence-based intervention strategies, and methods of supporting individuals with ASD

in educational settings, prior to, and following completion of *ASD and Behavioural Interventions.*

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by impairments in language, communication skills, and social interactions, in conjunction with restricted and repetitive behaviours, interests or activities (Public Health Agency of Canada, 2018). Characteristics of ASD fall along a wide spectrum, but may include: reduced abilities to maintain eye contact, low levels of responsiveness, reduced recognition and production of facial expressions, difficulties establishing joint attention, difficulties with verbal and nonverbal communication, difficulties understanding emotions and linguistic nuances, preference for solitary activities, difficulties socializing with others despite a desire to do so due to low social skills, atypical usage of language (i.e., echolalia, inappropriate or unusual tone), lack of imaginative play, repetitive behaviours (i.e., hand flapping), self-injurious behaviours, sensory sensitivities (hyper/hypo), and cognitive rigidity which may include difficulties regarding transitions (Politte, Howe, Nowinski, Palumbo, & Mcdougle, 2015).

Our most recent data of ASD prevalence and incidence rates within Canada come from the 2018 report by the Public Health Agency of Canada's National ASD Surveillance System (NASS). The NASS report surrounds children ages 5-17 years and includes data and statistics (2015) from six provinces and one territory: Newfoundland and Labrador, Nova Scotia, Prince Edward Island, New Brunswick, Quebec, British Columbia and the Yukon. According to NASS, as of 2015, approximately 1 in 66 children and youth in Canada are diagnosed with ASD. The statistic is highest within the province of Newfoundland and Labrador, where 1 in 57 individuals are diagnosed.

Additionally, boys are four to five times more likely to receive a diagnosis of autism in comparison to girls (Public Health Agency of Canada, 2018). While ASD prevalence rates have been increasing, many educational professionals report feelings of inadequacy and unpreparedness in supporting students with the disorder.

Purpose of Current Study

The present study is an evaluation of *ASD and Behavioural Interventions: An Introduction for School Personnel*. This study is critical, as only internal evaluations have been administered thus far, without dissemination of knowledge to academic or professional communities. As Scheuermann, Webber, Boutot, and Goodwin (2003) state,

> Training programs must not only teach best practice methods of instruction that are holistic but also assist teachers in learning to discriminate fads from effective methods. In order to arm teachers with the skills necessary to make this discrimination, it is imperative that training programs include program evaluation, research methods for evaluation of interventions, and reviews of literature (p. 201).

Proper and thorough evaluation of a course from an external party is salient to its integrity and quality. External reviews may determine if a course should undergo changes, continue as it has been, or cease in continuation altogether. The cited literature affirms the importance of a thorough academic evaluation of *ASD & BI.* It also suggests the lack of, and relevance of school personnel training pertaining to ASD and effective, evidence-based, interventions for the disorder. At present, ASD is a common exceptionality within schools, and many teachers are feeling unprepared and under trained to service them. Stahmer et al. (2015) state, "High-quality implementation of evidence-based interventions

for children with autism in schools is essential for ensuring the best outcomes for this growing population of children" (p.192). This is because proper employment of evidence-based techniques has been demonstrated, through research, to be effective.

The purpose of this program evaluation is to assess the impact and effectiveness of the course and whether or not the objectives of the course have been attained. This evaluation is quite necessary because at present, this training program has been offered from 2015 to the present, with only internal evaluations having been completed and no outcomes disseminated to the academic and professional communities. This study will encompass the first and only external review conducted on *ASD & BI.*

Research Questions

The following research questions underpin this study: How effective is *ASD & BI* perceived to be by participants? What is perceived as working well and what do participants perceive as not working? And, what is the typical demographic of participants who enroll in the course?

Limitations

Limitations of this study are confined mainly to the small sample size. The study obtains a sample size of 61 participants, and while data was collected from all participants across the Atlantic provinces, only New Brunswick participant data was utilized in this study. The New Brunswick Department of Education and Early Childhood Development and APSEA requested evaluation of *ASD & BI* for potential dissemination and publication across Departments of Education and Early Childhood Development, specifically the other participating Atlantic provinces. In total, 121 anglophone and 87 francophone participants from New Brunswick completed the course whilst data

collection was ongoing. However, only 54 anglophone and 7 francophone participants provided consent for inclusion within this study, resulting in a sample size of 61. Thus, the findings of this study should not be generalized to all professionals who have completed *ASD & BI,* but of the individuals who completed the training program in New Brunswick during the data collection timeline of November 2017-April 2018.

Additionally, while the course was open to a range of individuals possessing various roles inside educational contexts, most of the participants shared similar demographics. For example, most participants were classroom teachers or educational support teachers who were supporting individuals with ASD at the time of course completion. Additionally, the great majority of participants were females, with over ninety percent of participants obtaining university-level degrees, and nearly all of the participants were working in full-time positions while completing the course.

Glossary of Terms

The following is a glossary of frequently appearing terms with corresponding definitions. This tale has been designed to assist readers in understanding the text and retrieving information efficiently and effectively (See Table 1.1).

Table 1.1

Glossary of Terms

Term/Abbreviation	Definition
Andragogy	Andragogy refers to adult education. It encompasses all practices and principals employed in adult learning.
Applied Behaviour Analysis (ABA)	Applied behaviour analysis is an evidence-based intervention that may be used with individuals with autism spectrum disorder. It is behaviour therapy employed in real-life situations. ABA includes explicit teaching of social skills and tasks, application, observation and functional behavioural analysis, and positive reinforcement.

Autism Spectrum Disorder (ASD)	Autism Spectrum Disorder will oftentimes be referred to as ASD during this study. ASD is a sensory processing disorder that affects 1 in 66 Canadians. Individuals with ASD experience a wide variety of symptoms and characteristics. Each individual with ASD may display different characteristics. This is why it is referred to as a spectrum disorder.
Autism Spectrum Disorder and Behavioural Interventions: An Introduction for School Personnel (ASD & BI)	*Autism Spectrum Disorder and Behavioural Interventions: An Introduction for School Personnel* is the course we are evaluating through this study. It will often be referred to as *ASD & BI*. This is an androgynous online course aimed to teach evidence-based techniques to school personnel who wish to extend their knowledge around ASD and appropriate practices.
Evidence-Based Intervention (EBI)	Evidence-based interventions (EBIs) are interventions that have been proven, through scientific research studies to be effective. EBIs form the core of *ASD & BI*. EBIs and evidence-based practices (EBPs) are sometimes used synonymously in literature. However, they are not the same. EBP refers to the broader ideology of appropriate research-based practices and EBIs refer to specific interventions.
Mixed Methods Research	This study is a mixed-methods research approach. This approach combines characteristics and techniques from both quantitative and qualitative research to form a thorough and complex study.

Summary

The chapters to follow include Chapter Two: Literature Review, Chapter Three: Methodology, Chapter Four: Results, and Chapter Five: Discussion.

Chapter Two is a review of recent literature that allows the reader to ascertain knowledge of topics to be discussed and examined within this study. The literature review establishes purpose for completion of research in the field of ASD and teacher training, specifically in the use of adult online learning that disseminates knowledge of evidence-based interventions. It underpins reasoning as to why courses like *ASD & BI* must undergo external reviews in light of the current study.

Chapter three outlines the research tradition chosen for the current study. It explains why the specific methodology has been chosen, describes participant-recruitment and indicates specific data collection and analyzation measures.

Chapter four presents the results generated throughout the research study. It reports on findings established through the project. Within this study this includes: participant demographics, qualitative and quantitative results and a summary of what these findings may imply.

Chapter five describes in detail the findings that had been presented in chapter four: results. In addition to this, it provides recommendations for future direction in this field of study.

Chapter Two: Literature Review

Internet-Mediated Andragogy

Andragogy is the concept of adult learning. Andragogy emerged within the early 20th century, following economic, political, and societal changes throughout the world that required adult learning to undertake a unique approach, (Conaway and Zorn-Arnold, 2015). *ASD and Behavioural Interventions: An Introduction for School Personnel* is an online training program developed for androgynous learners who wish to acquire additional information surrounding ASD and appropriate interventions.

Since the development of andragogy, various studies have been completed on the concept. Knowles (1984) established six principles of the andragogical concept which help define the purpose and objectives of andragogy. Knowles (1984) six principles include: role of experience, self-directedness, the learner's need to know, readiness to learn, orientation to learning, and intrinsic motivation. The work of Knowles (1984), according to Conaway and Zorn-Arnold (2015) helps to distinguish differences and similarities between adult and childhood learning. They ascertain that adults (dissimilarly to children) possess an extensively large bank of life experiences that contribute to a sizable accumulation of knowledge. Due to this, within andragogy, the experiences of the adult learner should be taken into great consideration. Experience is "the foundation upon which all learning can exist" (p. 39). Adults are also highly self-directed. Adults should be able to establish direction and autonomy over their own learning in environments in which they may work at their own pace and establish responsibility over their work. *ASD & BI* assumes that adults are self-directed and perform best in environments in which they

have elements of control and responsibility, allowing learners to complete the modules at their own pace, with loose deadlines.

Additionally, adult learners understand that they must often pursue greater knowledge bases or skill sets to move forward within their careers and obtain their goals. A main difference between the adult learner and the child learner, is that the adult has identified an area of weakness or a gap within their knowledge base, and are thus, taking responsibility to address it (Conaway & Zorn-Arnold, 2015). Adults who decide to enroll in training programs such as *ASD & BI* have identified and understand the purpose of doing so and are likely engaging in such an activity to improve their abilities to teach and support students with ASD. Adult learners often possess a greater readiness to learn. Davenport and Davenport (1984) suggest that adult students are usually ready to do whatever it takes to learn because they have developed the maturity to understand that the outcome of their learning and or training will have a tangible effect on some element of their lives (be it their social roles or responsibilities, their roles as an employee, parent, etc. Adults are differently orientated to their learning in comparison to children. As an adult, individuals seek out knowledge and training to better themselves in a variety of areas. Furthermore, adults experience intrinsic motivation to partake in educational and or training programs. It is the pride and accomplishment, combined with the skill sets received by completing training and further education that motivates adult learners (Conaway & Zorn-Arnold, 2015).

In today's society, andragogical learning make take many shapes and forms. One of the most popular forms of andragogical learning is internet-mediated or distance-based. *ASD & BI is* an example of internet-mediated andragogy. Roll-Pettersson et al. (2010)

state “Distance learning is documented as an effective method in regard to the dissemination of empirically-supported interventions and academic knowledge” (p. 250). *ASD & BI* is a distance and multimedia-based training program that is ideal school personnel who may not possess the abilities (financially, locational, or timewise) to partake in on-campus courses or programs in ASD.

There is currently a great demand for teachers and school personnel who possess a knowledge base of ASD, and behaviour supports. Stahmer, Rieth, Lee, Reisinger, Mandell, and Connell (2015) describe how implementation of high-quality and evidence-based interventions (EBIs) for individuals with ASD in educational contexts is critical in ensuring the best outcomes for this growing population. They mention that “Specifically examining training needs and fidelity of implementation of paraprofessional staff compared with teachers and other professionals is needed” (p.192). Time and effort must be placed into evaluating the competencies of educational professionals in supporting students with ASD and in developing strategies to improve competency and training. The demand for well-trained and knowledgeable professionals far outweighs the personnel who may be considered specialists in this area, as there are limited graduate-level courses and programs surrounding ABA. “This situation has led to professionals who lack both adequate knowledge and relevant experience [to be able to claim that] they are proficient in behaviour analysis” (Roll-Pettersson, Rosales, Keenan, & Dillenburger, 2010, p. 247-248). *ASD & BI* has been designed to help address this issue. Roll-Pettersson et al. (2010) suggest that one way we may bridge the gap between the increasing number of students with ASD and the limited number of teachers that possess effective and accredited

knowledge and skill sets to support these students is by implementing distance learning programs to educate teachers and school personnel on ASD.

Understanding the concepts of andragogy and online-mediated learning is important in understanding the purpose and function behind *ASD & BI.* This training program has been designed with adult learners in mind. The goal of the program is to assist school personnel in receiving effective and useful training in ASD and related evidence-based interventions.

Autism Spectrum Disorder

With the research indicating 1 in 66 youth in Canada receive a diagnosis of ASD each year, ASD is a relatively common and complex disorder, of which presently, quite little is understood. We do know that approximately 31% of people with ASD possess an intellectual disability, about 23% of individuals possess cognitive abilities that function within the borderline range and medical comorbidities are quite common as well. These comorbid disorders include seizure disorders, sleep disturbances, and gastrointestinal problems (Politte et al., 2015). However, ASD is very much a spectrum disorder. This means that while some individuals with ASD possess intellectual disabilities or communicational difficulties other individuals with ASD have nearly average or above average cognitive and communication abilities. Additionally, some persons with ASD may present advanced abilities in certain areas (Simpson, McKee, Teeter, and Beytien, 2007). ASD is usually identified during early childhood, as traits are often apparent in infancy, and typically persist across the lifespan (Politte et al., 2015). It is mandated by the New Brunswick Inclusive Education policy that all students, including individuals with disabilities, receive inclusive education. Inclusive education refers to “the pairing of

philosophy and pedagogical practices that allows each student to feel respected, confident and safe so he or she can participate with peers in the common learning environment and learn and develop to his or her full potential" (New Brunswick Department of Education and Early Childhood Development, 2013, p.2). This means that individuals with ASD should be receiving services from a variety of individuals within the school system (classroom teachers, instructional resource teachers, guidance counsellors, educational psychologists, speech language pathologists, student assistants, etc.), in environments that are the least constraining and most inclusive for the student. Consequently, is critical for such school personnel to possess familiarity with the characteristics of ASD and to acquire knowledge of appropriate evidence-based interventions to employ with such students.

Teacher Training in Autism Spectrum Disorder

Shyman (2012) explains that although we are seeing increasing numbers of individuals diagnosed with ASD within current school systems, the field of teacher preparation surrounding ASD is in its infancy. Due to the fact that individuals with ASD experience complex and diverse behavioural, social, and linguistic characteristics that require specialized educational needs, current teachers must become better equipped to meet such needs (Shyman, 2012). The National Research Council (NRC) (2001) found that teachers lack expertise in the area of ASD. They often do not possess adequate knowledge of the disorder itself and possess insufficient knowledge of how to teach individuals with ASD. Teacher qualifications, preparedness, and especially teacher-shortages are known issues that have been interfering with quality of education and student achievement (Scheuermann, Webber, Boutot, & Goodwin, 2003). Many teachers

and related school personnel feel ill-equipped and undertrained in ASD and behavioural interventions and due to this, lack confidence in their ability to support students with ASD. Marder, DeBettencourt, Alexander, Ayres, and Smith (2015) emphasize that many teachers and school personnel lack post-secondary training related to supporting individuals with ASD and that once teachers become employed, opportunities for in-service and training on EBPs and ASD becomes even more difficult to attain (as cited in Lang et al., 2010). These factors influence how often, or how effectively interventions are implemented to support students with ASD. The NRC states that "Personnel preparation remains one of the weakest elements of effective programming for children with autistic spectrum disorders and their families" (2001, p. 225) *ASD & BI* is designed to supply school personnel with the knowledge, skill sets, and techniques necessary to provide effective and appropriate support to students with ASD.

Due to the current developments regarding prevalence and litigation, school districts now possess larger obligations to ensure that educators and associated personnel are receiving training that includes EBIs to service individuals with disabilities such as ASD. Educators and related personnel that support individuals with autism must receive quality, up to date training on a range of holistic and research-based interventions they may use when working with said students. Scheuermann et al. (2003) state:

> Training programs must not only teach best practice methods of instruction that are holistic but also assist teachers in learning to discriminate fads from effective methods. In order to arm teachers with the skills necessary to make this discrimination, it is imperative that training programs include program evaluation,

> research methods for evaluation of interventions, and reviews of literature (p. 201).

Professionals that support individuals with ASD must be aware of the implications of ineffective instructional strategies when used with these students. Insufficient and incredible intervention can elicit significant negative impacts for students who display such wide and diverse learning needs (Scheuermann et al., 2003). Application of interventions that are not evidence-based may have detrimental effects on the student. "We encourage composite training programs that are based in applied behaviour analysis and emphasize using ABA techniques in natural contexts" (Scheuermann et al., 2003, p. 201). This means that professionals that support individuals with ASD must not only receive training on teaching of academics but must learn behaviour management techniques beyond those commonly covered in behaviour management education for students with exceptionalities apart from autism. This is because for individuals with autism, "basic functional and learning skills are usually delayed or absent, and many students demonstrate extreme aggressive, self-abusive, or noncompliant behaviours. Because of these characteristics, teacher must use specialized instructional techniques or students will not learn (and may even regress)," (Scheuermann et al., 2003, p. 198). Oftentimes, personnel seek training in ASD as a response to a problem, and while all training is supported, teachers may not encounter such problems had they received appropriate and effective training in the first place (Scheuermann et al., 2003).

Eight recommendations for personnel preparation regarding ASD have been suggested by Scheuermann et al. (2003). They recommend the use of university models as methods of training professionals. Within university models or similarly structured

programs, they advocate for the use of distance learning (as is used within *ASD & BI*), stating, “Distance learning is another method for increasing the number of teachers who might be trained. Interactive TV and online instruction provide avenues for reaching practicing teachers or pre-service teachers who might not be able to travel to higher education facilities’ (Scheuermann et al., 2003, p. 202). They suggest the use of in-service models as methods of training educational professionals to work with individuals with autism. They suggest training teachers in multiple effective approaches. Oftentimes, ASD training is based mainly on a single theory. This can be quite detrimental to the education of the student with ASD in many ways (Scheuermann et al. 2003). They suggest that personnel from various disciplines are prepared to work with individuals with ASD. To effectively support an individual with ASD it requires a team of knowledgeable people. Professionals such as speech-language pathologists, occupational therapists, physical therapists, school nurses, general classroom teachers, educational psychologists, job coaches and behaviour specialists, and more, are individuals that be involved in supporting a student with ASD (Scheuermann et al., 2003). Due to an overall lack of resources within school districts (i.e., IRTs, educational psychologists, guidance counsellors, classroom teachers, etc.) there is an increasing reliance on educational assistants [student assistants] to provide instruction and support. Students with ASD may spend more time during an instructional day with paraprofessionals than they do with their teacher (Scheuermann et al. 2003). This supports why *ASD & BI* is not only offered to teachers, but to all school personnel. They suggest preparing paraprofessionals and in-home trainers, since students with ASD, especially low-functioning students with ASD, require a high one-to-one ratio in schools. They suggest parents receive training. They

suggest leadership initiatives and funds be provided to schools and districts to promote ASD personnel preparation, and, they suggest that technical assistance and support be provided to teachers when receiving training.

The lack of teacher training on ASD and effective evidence-based interventions to support such students indicate a demand for training programs for school personnel such as *ASD & BI.* Such programs must receive thorough and professional evaluation to ensure validity and effectiveness and to disseminate information so that quality of education for individuals with ASD may improve.

Evidence-Based Interventions for Autism Spectrum Disorder

All teacher education programs and training packages must be structured around evidence-based interventions. ASD is a disorder that is poorly understood in terms of causation, presentation, intervention, and treatment, and therefore it is critical that programs designed to train educational personnel to support students with ASD are employing evidence-based frameworks. "An evidence-based special education professional practice is **a strategy or intervention** designed **for use by special educators** and **intended to support the education of individuals with exceptional learning needs"** (bold in original text), (as cited by Council of Exceptional Children 2008), (Shyman, 2012, p. 191). These interventions have been researched and deemed effective and grounded in evidence. When teachers utilize practices that are not evidence-based, they are exposing themselves and their student(s) to interventions that have not yet been proven effective. Thus, they may waste time and energy implementing strategies that seem to have little effect or that result in negative effects for the student(s).

However, there are many difficulties encompassing proper implementation of EBIs for children with ASD specifically. One of the largest challenges is the complexity of these interventions (Stahmer, Rieth, Lee, Reisinger, Mandell, & Connell, 2015). Teachers may not implement EBIs, or may not implement EBIs accurately, for a variety of reasons. Stahmer et al. (2015) surmise that one of those reasons may be due to inadequate or limited instruction and training of specific interventions. Another reason may be that within certain schools, administrators may mandate the use of specific programs that are not evidence-based or appropriate for the teacher(s) or student(s).

` The most recent and influential reviews specific to evidence-based treatments for young people with ASD have been completed by the National Autism Center (NAC) within the National Standards Project (NSP) and the National Professional Development Center on Autism Spectrum Disorders (NPDC), (Wong, Odom, Hume, Cox, Fettig, Kucharczyk,...Schultz, 2015). The NSP report identifies a list of 14 evidence-based interventions that have been researched and proven effective for children, adolescents, and young adults under 22 years of age. As well as 18 emerging interventions that have proven somewhat effective, but are not yet identified as being truly effective, and 13 unestablished interventions that are lacking sound evidence of effectiveness. The report also identifies one established intervention for adults with ASD of age 22 years and older, one emerging intervention, and four unestablished interventions (National Autism Center, 2015). For individuals under the age of 22, the National Autism Center (2015) recognizes the following as evidence-based and effective: behavioural interventions: cognitive behavioural intervention package, comprehensive behavioural treatment for young children, language training (production), modeling, natural teaching strategies, parent

training, peer training package, pivotal response training, schedules, scripting, self-management, social skills package, and story-based intervention. They list: augmentative and alternative communication devices, developmental relationship-based treatment, exercise, exposure package, functional communication training, imitation-based intervention, imitation training, language training (production and understanding), massage therapy, multi-component package, music therapy, picture exchange communication system, reductive package, sign instruction, social communication intervention, structured teaching, technology-based intervention, and theory of mind training as emerging practices. Lastly, they identify animal-assisted therapy, auditory integration training, concept mapping, floor time, facilitated communication, gluten-free/casein-free diet, movement-based intervention, SENSE theatre intervention, sensory intervention package, shock therapy, social behavioural learning strategy, social cognition intervention and social thinking intervention as not yet established interventions (2015). For individuals over the age of 22 the only established evidence-based interventions thus far is behaviour interventions. Vocational training package is an emerging intervention, and cognitive behavioural intervention package, modeling, music therapy, and sensory integration package have been deemed unestablished as of recent (National Autism Center, 2015).

In 2010 Odom, Collet-Klingenberg, Rogers, Hatton, and Deborah published a review, established by researchers from the NPDC, which identifies 24 EBPs for individuals with ASD. The authors categorized the EBPs within two subgroups: behavioural teaching strategies (based on the principles of applied behaviour analysis) and strategies for interfering behaviours (positive behaviour supports), (Odom et al.,

2010). The 11 behavioural strategies considered EBPs are as follows: prompting, reinforcement, task-analysis and chaining, time delay, computer aided instruction, discrete trial training, naturalistic interventions, parent-implemented interventions, peer-mediated instruction/intervention, picture exchange communication system, and pivotal response training. The 13 positive behavioural support strategies include: functional behaviour assessment/analysis (FBA), stimulus control/environmental modification, response interruption/redirection, functional communication training, extinction, differential reinforcement, self-management, social narratives, social skills training groups, structured work systems, video modeling, visual supports, and Speech Generating Devices, (Odom et al., 2010).

In 2015, Wong, Odom, Hume, Cox, Fettig, Kucharczyk,...Schultz (2015) developed an extension and elaboration on Odom et al. (2010) review. This study identifies 6 new evidence-based intervention strategies for a total of 27 EBPs. The 6 new intervention practices are: cognitive behavioural intervention, exercise, modeling, scripting, and structured play groups. Technology-aided instruction and intervention took the place of computer-aided instruction and speech generating devices (Wong et al., 2015).

Many researchers have identified core elements that should be included within educational personnel training and student intervention programs. Scheuermann, Webber, Boutot, and Goodwin (2003) provide a list of areas suggested to be core components within comprehensive teacher education programs in ASD. These suggested areas include knowledge of the disorder, parental involvement, theoretical bases of instructional approaches, including multiple approaches, teaching language and communication, social

competencies, adaptive behaviours and transitions, classroom structure, behaviour management, and additional special issues. Additionally, the NRC recommends that educational goals for children with ASD include personal independence and social responsibility, social and cognitive abilities, adaptive skills, reduction of behavioural difficulties, verbal/nonverbal communication skills, and generalization of such skills across multiple settings. In addition to this, the NRC identifies six areas of need for students with ASD. These areas of need include: functional spontaneous communication, play skills, cognitive development, social skills, proactive approaches to behaviour problems, and functional academic skills (Stansberry-Brusnahan & Collet-Klingenberg, 2010).

ASD prevalence rates have continued to climb and therefore it is critical that professionals that support individuals with ASD (i.e., teachers and other educational personnel, occupational therapists, social workers, healthcare professionals, etc.) possess knowledge of effective and evidence-based interventions to employ and methods for which to structure programs for such students. Educational practice must be based upon scientific evidence and evidence-based intervention techniques for children and youth with ASD (Odom et al., 2010). Yet, educators often feel that they lack sufficient knowledge of EBIs that is necessary in order to implement them in their teaching. It is often challenging for educators to know which interventions are appropriate to implement and or how to implement them. Thus, appropriate, effective, and evaluated training programs must be established for educational practitioners who work with students who have ASD. Marder et al. (2015) state “The best way for schools to provide effective educational settings for the growing number of students with ASD is by training and

supporting teachers on a number of EBPs" (p. 21). In saying this, program developers have a responsibility to ensure that their programs include EBIs, and that such programs receive appropriate evaluation to ensure effectiveness.

Applied Behaviour Analysis and Autism Spectrum Disorder

"Applied behaviour analysis (ABA) is the process of systematically applying interventions, based upon the principles of learning theory, to improve socially significant behaviours to a meaningful degree" (Autism Canada, 2017, paragraph 1). ABA is an evidence-based intervention that may be utilized as a treatment method for individuals with ASD. Implementing ABA assists in teaching explicit behaviours to individuals with ASD who have difficulty understanding and developing these behaviours on their own, in their natural settings. ABA employs behavioural observation and data analysis, in addition to positive reinforcement or prompting to teach step by step behaviours and may be used to assist children in developing desired behaviours (ie: performing academic tasks or communicating), or, to reduce undesired behaviours (ie: self-injurious or aggressive behaviours). ABA utilizes FBA to identify and analyze antecedents and consequences to reduce or change the child's current behaviour(s), and/or to develop new ones (Autism Canada, 2017). ABA focuses on naturalistic language training that is structured within a play-based environment. Within such an environment, the therapist, teacher, guardian, etc. delivers reinforced cement for all verbal attempts. Toys and other play items are utilized during these sessions to allow modeling of appropriate play and speech (Roane et al., 2016). Additional naturalistic language interventions with empirical evidence to support them are: pivotal response training (PRT) and the Early Start Denver Model (ESDM). Pivotal response training focuses on pivotal, key areas of communication for

individuals with ASD, such as: motivation to interact with others, self-management, self-initiation, and responsiveness to multiple cues (Roane et al., 2016).

ABA and related research have a broad and complex background that has been emerging and developing for almost a century. The basic ideologies and principles that surround ABA emerged through research conducted by B.F. Skinner in the late 1930s, and through his proposal that behaviour is determined through a process called selection of consequences (Roane, Fisher, & Carr, 2016). Skinner's work revealed that behaviours that result in preferred outcomes will be maintained through the process of reinforcement and behaviours that do not result in preferred outcomes can be changed decreased, or eliminated overtime through the utilization of reinforcing consequences, prompting, and modeling (Roane et al., 2016).

Following Skinner, O. Ivar Lovaas became a key player in the development of ABA. Lovaas was an early ambassador of ABA, and from 1927-2010 he spent nearly half a century conducting critical research and developing interventions for individuals with ASD. His work still stands to support that children who receive early intensive ABA interventions make huge gains in development (Smith & Eikeseth, 2011). In the 1960s Lovaas pioneered ABA interventions developed to reduce severe challenging behaviours and develop communicative language. During this time, he established the first true treatment of ABA for ASD, known as early and intensive behavioural intervention (EIBI). This treatment model is comprehensive and suggested that children with ASD receive intense intervention to be conducted 5-7 days per week, for up to 40 hours per week. This was the first time somebody had attempted and recommended working with children with ASD so intensively. EIBI treatment is intended to be delivered in a one-to-

one setting when beginning and may be applied within a group setting thereafter (Roane et al., 2016). It is a model that relies greatly on discrete-trial teaching (DTT), "which focuses on teaching skills in a repeated and brief fashion with a specific instruction (the "discriminative stimulus") while minimizing extraneous details, thereby making the instruction "discrete" (Roane et al., 2016, p. 28).

In 1965 Lovaas published a succession of articles that changed ABA and services for ASD forever. The first two articles described the coding system he utilized when coding behaviours of individuals with ASD during direct observation. A system that employed identification of antecedents and consequences that supported problem behaviours (what is now known as FBA). Later reports identified most effective ways to teach nonverbal children with ASD to communicate, and additional studies described intervention strategies to reduce undesirable behaviours, and behaviours that are self-injurious or aggressive (Smith & Eikeseth, 2011). While Lovaas' name is synonymous with the term ABA, his work and developments were due in part to the bank of research and work surrounding ABA and ASD conducted by many individuals, such as B.F Skinner, Don Baer, Sid Bijou, Ted Ayllon, Isreal Goldiamond, Todd Risley, Mont Wolf, Hayden Mees, and others.

In 2015 Smith and Iadrola published a study that identified two interventions that meet Chambless and Hollon's criteria for a "well-established" treatment. One of those treatments is individual, comprehensive ABA (ie: EIBI) and the second is teacher delivered ABA. Moreover, there is much additional research that identifies ABA as a strong, empirical, evidence-based intervention. The National Standards Project (2009) states that educators must receive training on evidence-based interventions to employ

with students on the autism spectrum. In particular, strategies based on the principals of applied behaviour analysis should be of focus, as these interventions have the strongest evidence to support their use.

Teachers need assistance attaining knowledge of ASD and ABA and developing the skill sets necessary to implement appropriate behavioural interventions to their students with ASD within the classroom. Lovitt (2012) states: "Teachers would be far better off if they examined all seven aspects [of ABA] and did their best to implement them. But if they cannot bring themselves to carry out the technical characteristics of ABA… they should at least develop a solid behavioural attitude by accepting the five philosophical features" (Lovitt, 2012, p.253). He emphasizes that there has been too heavy a focus on standardized assessments within education, and that, students' behaviour must be evaluated and monitored continually and naturally. Contingency management, according to Lovitt (2012), should be the most important, if not the sole method teachers should employ if they wish to change the academic and social behaviours of their students. Additionally, teachers must apply FBA to determine antecedents, behaviours, and consequences of behaviours if they wish to make changes.

Individuals with ASD who receive interventions that are based upon ABA have been shown to consistently demonstrate educational and social gains (Grey, Honan, McClean, & Daly, 2005). Many educational personnel however, report feelings of incompetence in the field of ASD and appropriate interventions such as ABA. This must change due to the fact that general classroom teachers are receiving increased responsibilities to support individuals who possess special educational needs such as autism within the classroom setting. Skills training for school personnel in the area of

ASD and ABA is a precursor to inclusive classrooms that service all children appropriately.

Summary

Recent literature describes the increasing prevalence rates of ASD in Canada and the lack of effective teacher training on EBIs to support such individuals. The literature indicates that online learning may be part of the solution to this problem. *ASD & BI* was designed with the literature in mind, to provide school personnel training in interventions that have been proven effective.

Program evaluations are critical in ensuring that programs (such as *ASD & BI*), that being offered to school personnel are credible, effective, and informative. This study contributes to an externally non-existent body of research regarding this course and its validity. It will provide beneficial knowledge and a basis of information that will identify whether the program should continue within the Atlantic provinces, receive modifications and reconstructions, or discontinue. The following, chapter three, addresses the methods and methodology of the study.

Chapter Three: Methodology

Chapter three provides an overview of the current study. It describes mixed methods research within program evaluations and how such methodologies relate to this study. It provides details about participants and the recruitment processes, and illustrates the program and study design, instruments utilized, as well as data collection and analysis procedures.

Research Tradition

This study is a program evaluation of *ASD and Behavioural Interventions: An Introduction for School Personnel.* Program evaluations are necessary for newly implemented educational training programs such as *ASD & BI,* to ensure quality and effectiveness. External program evaluations are needed to identify areas of strength and need within the program, to appraise the appropriateness of a program, to identify perceptions of the program through participants, and to determine quality of the program (Mertens & Wilson, 2012). This study applied both quantitative and qualitative (mixed) research methodologies to collect and analyze data related to the training program, in order to produce a scholarly and comprehensive external review. A mixed methods research design is "a procedure for collecting, analyzing, and "mixing" both quantitative and qualitative methods in a single study or a series of studies to understand a research problem (Creswell, 2012, p.535). A mixed methods approach may be chosen for a variety of reasons. Some of which include: providing a better understanding of the research problem, the need to describe trends of large numbers of people yet the need to also provide actual perspectives of participants using their own words, one method may not be enough, or when researchers wish to provide alternative perspectives within a study,

(Creswell, 2012). This design was deemed appropriate as the goal of the research was to describe trends across large numbers of educational professionals who had enrolled in *ASD & BI* whilst additionally providing first-hand experiences with the course from the viewpoint of participants.

This study utilized a survey design through pre and post-test surveys that were built into the training program itself in addition to a post-test short answer questionnaire.

Participants

Participants included classroom teachers, instructional resource teachers, school administration, educational/student assistants (and others). These individuals were members of various school boards across New Brunswick, at differing stages in their careers, who possessed a range of educational certificates, diplomas, and degrees, and had diverse levels of experience and comfort working with individuals with ASD. Participants were recruited upon commencement of the training program, through a recruitment letter integrated within the D*esire 2 Learn* (anglophone) and *CLIC* (francophone) software and course shell. When course participants logged into the online training program, they received recruitment (see Appendix A) and informed consent information (see Appendix B). Following review of this information, course participants were given an online yes/no option to allow their survey data to be utilized for research purposes. Additionally, participants were offered some incentive for participating in the study. Participants were offered the opportunity to enter into a draw for free registration of the Autism in Education annual symposium, a value of approximately $200. While data was collected from individuals who participated in the program throughout all of the Atlantic provinces, only data from participants who provided consent within New Brunswick (both

anglophone and francophone) is utilized within this program evaluation. Participants for the current study consist of only individuals from New Brunswick. The total NB population that originally registered for the course was 273, (162 anglophone and 111 francophone). However, in order to be considered a participant in the study the individual must have completed the course in entirety. In this case, the population for the study was 208, (121 anglophone and 87 francophone). From these numbers, consent for participation within the study was provided by 54 anglophone individuals, and 7 francophone individuals, resulting in the total number of participants falling at 61.

Table 3.1

New Brunswick Anglophone Statistics 2017

Module Completion	Percent of Participants
All 10 Modules Completed	75%
Course Incomplete	25%
More than 5 Modules	4% of incomplete group
5 Modules or Less	6% of incomplete group
No Modules Completed	16% of incomplete group

Table 3.2

New Brunswick Francophone Statistics 2017

Module Completion	Percent of Participants
All 10 Modules Completed	78%
Course Incomplete	22%
More than 5 Modules	0.08% of incomplete group
5 Modules or Less	92% of incomplete group
No Modules Completed	71% of incomplete group

Resources

Due to the nature of this training program, the course itself and the program evaluation required limited resources. Users were required to access the program using a high-speed internet connection, within the *Desire 2 Learn* and or *CLIC* software. On

December 4th, 2017 the research team received ethics board (REB) approval to proceed with the current study. Additionally, on January 5th, 2018, the team was granted the SSHRC/Vice-President's Research Grant, providing $5616.00 towards research assistant work throughout the study.

Intervention

The Atlantic provinces have demonstrated a need for increased professional growth and development in the fields of ASD and ABA. *ASD & BI,* a course funded by the Atlantic Provinces Special Education Authority, was developed as a response to these needs. The course was designed by the New Brunswick Department of Education and Early Childhood Development team consisting of: Ruth Wilson (Learning Specialist Instructional Design and Development), Lori Thomas (Graphics and Multimedia Designer, Joe Finnamore (Programmer, Anglophone Sector), and Philippe Doiron (Programmer and Multimedia Designer, Francophone Sector). The course is offered through *Desire to Learn* (anglophone) and *CLIC* (francophone) learning management software and was designed for all educational personnel including teachers, school administration, educational assistants, speech-language pathologists, and psychologists. The online training program is comprised of 10 modules designed to provide educational personnel additional knowledge and skill sets regarding ASD and appropriate evidence-based interventions.

Table 3.3

ASD & BI Modules 1-10 Breakdown

Module Number	Modules Name	Hours
1	Introduction to ASD	2
2	Impact of ASD on Learning	3
3	Evidence-Based Practice	3
4	Identifying Learner Needs	4
5	Learning and Behaviour	5
6	Behavioural Approach to Developing Skills	4
7	Structuring the Classroom Environment	5
8	Communication Skills	4
9	Managing Challenging Behaviour	6
10	Social Skills	4

During January-March 2015 a pilot project emerged and was evaluated. Following the successful pilot project, the training program was implemented across the Atlantic provinces beginning in April 2015.

In November 2015, an internal implementation review was conducted by Dr. Kimberly Maich, PhD, OCT, BCBA and prepared for the Council of Atlantic Ministers of Education & Training & Atlantic Provinces Special Education Authority 'ASD & BI' Project. The purpose of this report was to complete a preliminary evaluation of the course with the goal being to assess the long-term impact and effectiveness of ASD & BI. The timeline for this internal review ran between February and November 2015 and it served as initial feedback towards the course. Similarly, as in the external review, data was collected through module exit surveys (both quantitative and qualitative) and in contrary to the external review, was additionally composed of documents and participant interviews. The internal review details the project's initial evaluation and provided recommendations for direction at that time.

Soon after the internal review had been conducted, a research team was designed to evaluate the effectiveness of the program externally. The team consisted of Dr. Kimberly Maich (B.A., BC.Ed., PDP/PBD, M.Ed., MADS, Ph.D*.),* Julie Michaud (M.Éd., BCBA,.), Isabelle Cowan (MASP, L.Psych., BCBA), Shelley McLean (M.Ed., BCBA), and myself, Chelsea O'Keefe (B.Ed., B.SpEd). Dr. Maich is a professor and researcher at Memorial University. Julie Michaud is the Learning Specialist for the Francophone sector of the New Brunswick Department of Education and Early Childhood Development. Isabelle Cowan is the Learning Specialist for the Anglophone sector of the New Brunswick Department of Education and Early Childhood Development. Shelley McLean is the Coordinator of the interprovincial Autism in Education Partnership for the Atlantic Provinces Special Education Authority (APSEA), based in Halifax. I myself, am a first-grade teacher, with experience as IRT, working towards a master's degree in education (curriculum, teaching and learning with a specialty in special education) at Memorial University. I joined the team in December 2017 in hopes of utilizing the current study as the foundation of my master's thesis.

Throughout my research, I have had to find a harmonious balance between my role as researcher as well as my role as instrument. The researcher as an instrument plays a critical role in the generation and interpretation of data (Xu & Storr, 2012). In this way, the researcher must be vitally aware of this construct in order to ensure an un-biased and thorough research study occur. As mentioned, I presently teach first grade. I teach in a K-6 school with an enrollment of approximately 200, on the Avalon Peninsula, in Newfoundland and Labrador. My background in teaching includes work as an instruction resource teacher in the primary/elementary grades and as a classroom teacher. In fact, I

completed *ASD & BI* myself in 2016 as a working IRT, prior to enrollment in my current master's program and subsequent involvement in the course external evaluation At the time of my own course enrollment I had been assigned to my first ever teaching position (as an IRT despite having only a quarter of my B.Spec.Ed completed at that time) in a densely populated K-3 school. . I personally found the course quite beneficial, specifically as a new teacher with limited training in ASD at that time. Presently, as researcher, I wonder if other participants experienced the same success with *ASD & BI* as myself. This is an extremely important area of research for me personally. My background in special education fostered an interest within me to work in the field. It especially sparked an interest to conduct research that may assist educational professionals in preparedness and training necessary to support learners with ASD. As a new teacher, working in a province with the highest prevalence rates of ASD in the country, I noticed that teacher training and ASD is an area of which significant research should be applied. Throughout the research I remained reflexive. I kept my own assumptions and preconceptions in the forefront of my mind (my own positive experience with the course, my opinion that the Atlantic provinces require additional teacher-training in ASD, etc.)

The team received clearance from the Interdisciplinary Committee on Ethics in Human Research (ICEHR) on December 4th, 2017 (see Appendix C). All active researchers within the study possess TCPS-2 certification. Dr. Kimberly Maich completed the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans Course on Research Ethics (TCPS 2:CORE) training on September 29, 2012 (see

Appendix D). I (acting research assistant for the project) completed TCPS 2: CORE on December 17th, 2017 (see Appendix E). The course evaluation progressed from there.

The purpose of a study such as this is to conduct a province-specific (New Brunswick) program evaluation of *ASD & BI*. Anticipated benefits to society from this evaluation include improved course outcomes and knowledge and skills around supporting students with Autism Spectrum Disorders in school settings.

Data Collection

Data for this study was collected from New Brunswick participants between November 2017 and April 2018. Data were collected through the *Desire 2 Learn* and *CLIC* software from module surveys which were integrated into the training program itself. "Survey research designs are procedures in quantitative research in which investigators administer a survey to a sample or to the entire population of people to describe the attitudes, opinions, behaviours, or characteristics of the population" (Creswell, 2012, p.376).

Surveys were included within all 10 of the course modules and were additionally included at course entry and exit. The pre-test survey possesses a quantitative (rating scale) piece, and the post-test survey is comprised of both a quantitative (rating scale) and qualitative (short answer response) component. The quantitative rating scales provided participants pre- and post-test opportunities to scale their comfort level in areas such as recognizing key characteristics of ASD and how these characteristics may impact learning, to recognizing interventions for learners with ASD that are evidence based and non-evidence based. Whilst the qualitative short answers probed participants to discuss their personal experiences with the course, for example, what they felt was the most

positive aspect of the learning experience, interventions they learned and implemented with students and recommendations for improvement of the course. It was mandatory that course participants complete all of the module surveys to be considered a participant within the study. Survey research is used to describe trends, determine opinions, and, are used to provide information that is used to evaluate programs in schools (Creswell, 2012). These module surveys concentrated on the timing, learning, and content of the course utilizing numerical data, yes/no questions, rating scales, and checklists, with room for open-ended responses. See Appendix F which describes the exit module surveys in detail.

Within the current study, these surveys provided automated, anonymized data from all participants, both anglophone and francophone, within the province of New Brunswick. This data was stored electronically on the *Desire 2 Learn* and *CLIC Learning Management Systems.* Identifying characteristics (i.e., name) were removed from data prior to its use. Additionally, electronic data had two levels of password protection and were only accessed by the project researchers and research assistant assigned to this project. Data will be kept for a minimum of five years after which will be deleted.

Data Analysis

Many steps were taken in the processes of analyzing the data throughout this study. In October 2017 frequency tables were completed that highlighted participant demographic information. In November 2017 a pre-and post-test comparison table was created which compared the quantitative results of the pre and post-test surveys. In December 2017 a qualitative data table was created that analyzed the qualitative data produced through the post-test survey. Also, in December 2017, bar graphs were generated from the demographic frequency tables that display participant demographic

information. Finally, in February 2019, data analysis was completed using The IBM Statistical Package for the Social Sciences (SPSS). The Wilcoxon Signed-Rank (which is a non-parametric statistical hypothesis test) was utilized to compare the pre and post-test data. This test is "used in situations where you want to compare two sets of scores that are related in some way (e.g., they come from the same entities" (Field, 2018, p.297). The Wilcoxon Signed-Rank test, a non-parametric test, was as an appropriate tool to utilize because the Shapiro-Wilk test of normality determined that the data was not normally distributed. The researcher analyzed data retrieved from pre and post-test surveys completed by participants that focused on specific skills for educational personnel regarding ASD and compared this data to determine if a significant difference could be found between the two.

Summary

The data collected throughout this study presents critical information to the course evaluation of *ASD & BI.* The majority of anglophone and francophone participants completed all 10 course modules and the corresponding module surveys, resulting in a pool of pre and post data that could be analyzed to determine if the completion of the course shifted participants' attitudes and perceived competence in one's teaching of individuals with ASD. In chapter four to follow, the results of the study will be discussed. Conclusions that have emerged through these results will be explored and an overall evaluation of ASD and Behavioural Interventions will develop.

Chapter Four: Results

Chapter four includes results of the current study. These results are comprised of participants' demographic information as well as quantitative and qualitative research findings pertaining to the course evaluation of *ASD and Behavioural Interventions: An Introduction for School Personnel*.

The researchers wanted to discover how effective *ASD and Behavioural Interventions* is perceived to be, what participants perceive to work, and what they feel requires improvements, in addition to the typical demographic of participants.

Demographic information for participants is compiled and displayed using frequency tables and bar graphs. Quantitative data were analyzed using the Wilcoxon Signed-Rank Test, and qualitative data were explored for themes and analyzed using Dedoose, an online data analysis software. Results are presented below.

Participant Demographics

It is important to determine and analyze the participants' demographics within this study. Researchers must consider participant demographics because "without the inclusion of such information, the researcher risks assuming the stance of 'absolutism', which assumes that the phenomena of interest are the same" (Scheffner Hammer, 2011, p.261), despite the many differences the participants possess (cultural, gender, social, etc.). Absolutism refers to the concept of assumption that all participants possess the same background schema, the same viewpoints, and interests. This is rarely the case. Differing cultures, genders, social-economic status', professions, etc., should be taken into account in the form of participant demographics whilst analyzing a data set, as these characteristics often influence perception and interest.

The participants of this study (n = 61) include a range of individuals functioning in a variety of roles within the education system. Most (n = 61, 52.4%) of the participants are classroom teachers (52.4%) and educational support teachers (21.3%) who were supporting individuals with ASD within at the time of course completion (72.1%). The vast majority (90.1%) of participants are females. Most possess a university degree 91.5%) Lastly, a majority (98.3%) of participants report working in full-time positions.

This demographic information is presented through the use of data graphs. Data graphs can be found within any research study, regardless of method. As Boers (2018) noted, research possesses little use if the results are not properly or effectively communicated (p.833). Data presented visually through graphs are critical in any report because they serve to convey information clearly. Krawiec (1995) explains why researchers choose to include graphs and tables when presenting their results, stating, "both qualitative and quantitative results may be organized into tables, illustrations, or graphs for presentation. Visuals allow the audience to follow the presentation more closely and recall the important aspects of the research" (p.92). In this study, histograms have been created to indicate the participant demographics and to display the information in a quick and efficient manner, communicating the patterns of the data set in a clear and concise visual (Godau, Vogelgesang, & Gaschler, 2016, p.71).

In this study, gender demographics are important to present, as there was a significant discrepancy between the number of females (n = 55) and males (n = 5) that enrolled in the course, while one participant (n = 1) chose not to indicate gender. (See Figure 4.1).

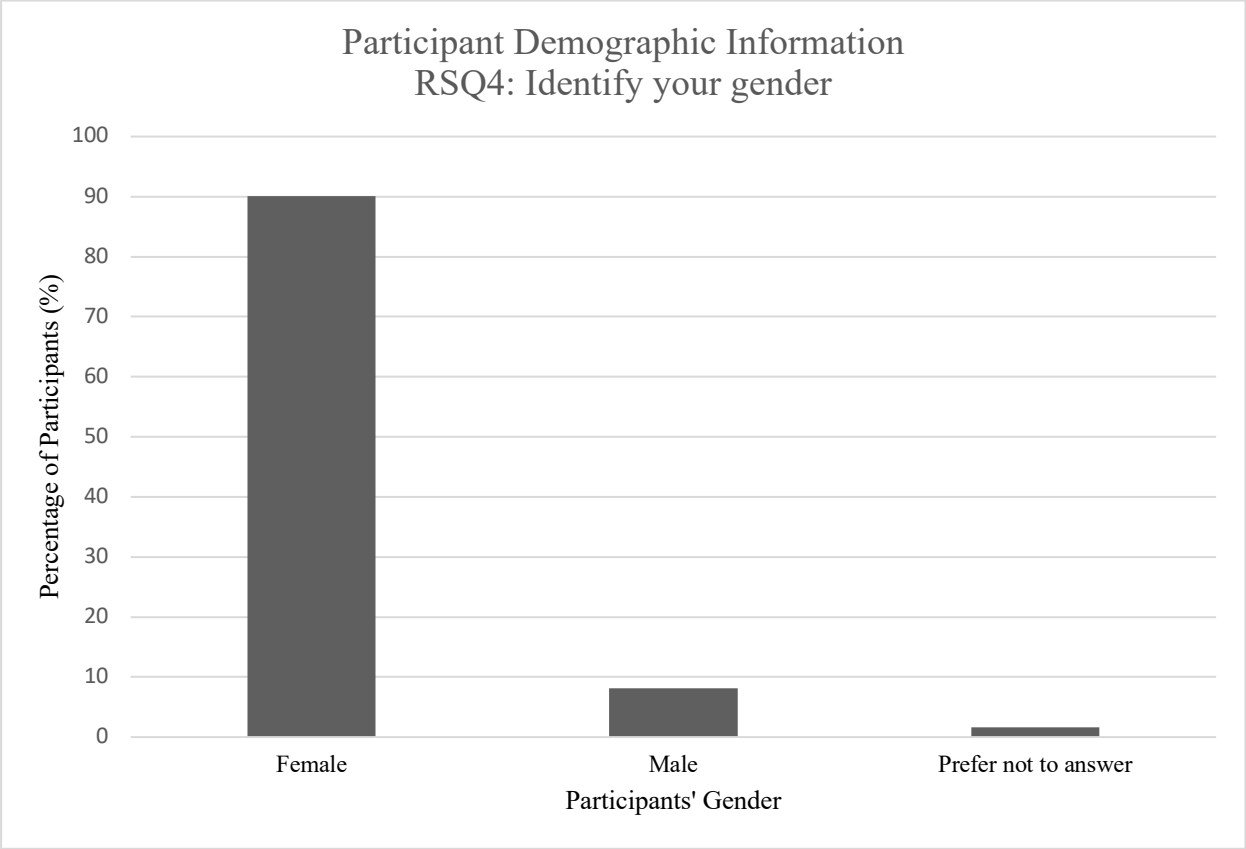

Figure 4.1. Participant demographic information (gender)

The participants of this course came from a wide variety of educational backgrounds and positions. The majority of participants were subject teachers (*n* = 32), following subject teachers were educational support teachers (*n* = 13) and other (*n* = 9). Other refers to supply teachers, educational assistants, “complex case” teachers, counsellors, subject teachers on educational leave, education support teachers, and integrated services (francophone only. Three administrators enrolled (*n* = 3), two district lead teachers (*n* = 2), and two outside agency professionals, one (*n* =1) social worker and one (*n* = 1) first nation intervention worker. (See Figure 4.2).

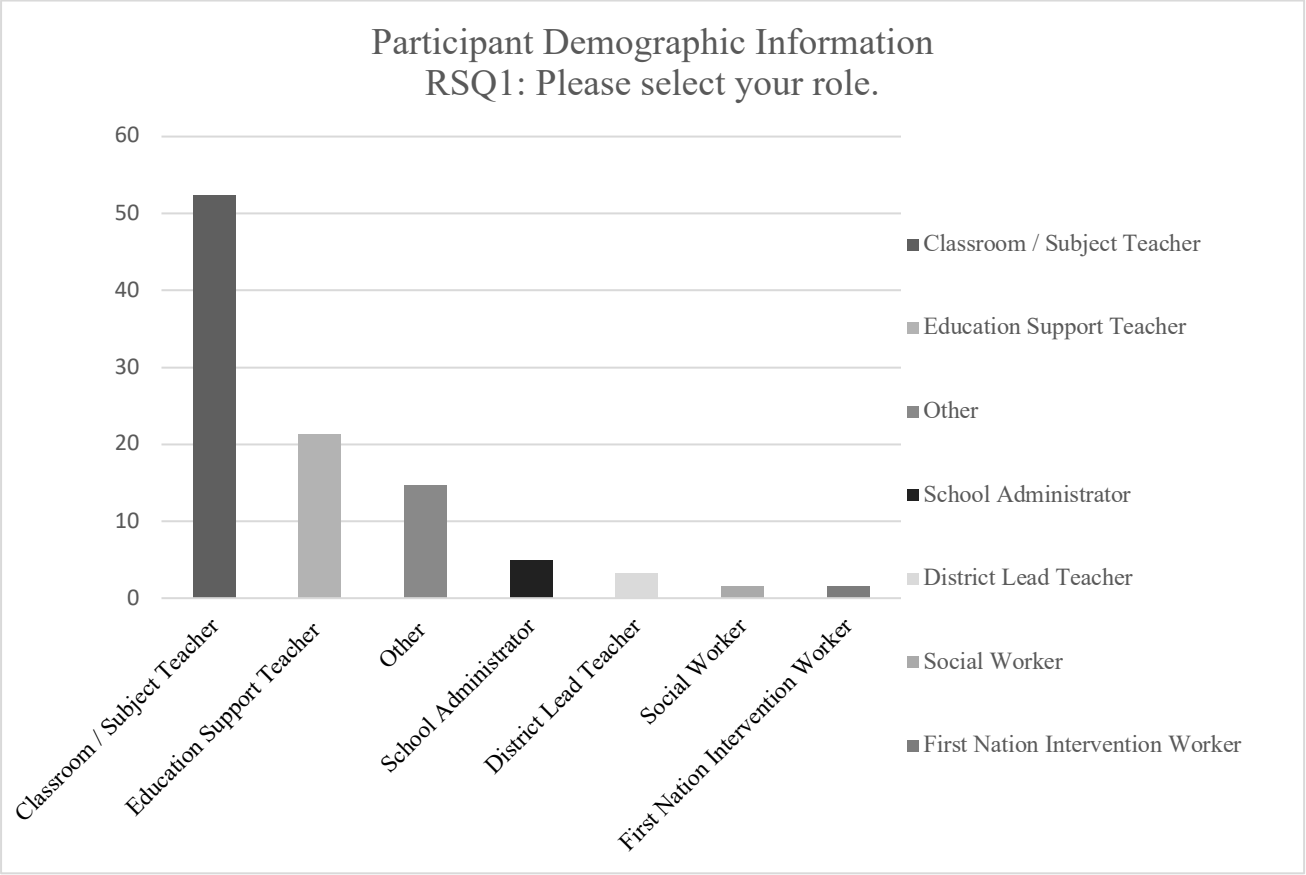

Figure 4.2. Participant demographic information (role)

The majority of participants possessed university level post-secondary, i.e., a bachelor's degree (*n* = 25), a university degree (*n* = 15), master's degree (*n* = 12), or a university degree above bachelor's (*n* =3). Other participants possessed a college diploma (*n* = 2), high school or equivalent (*n* = 2), a certificate above bachelor's (*n* =1) and a trades certificate (*n* = 1). Additionally, more (*n* = 44) participants were supporting a learner with ASD as they completed the course, than not (*n* = 17). (See Figures 4.3 and 4.4).

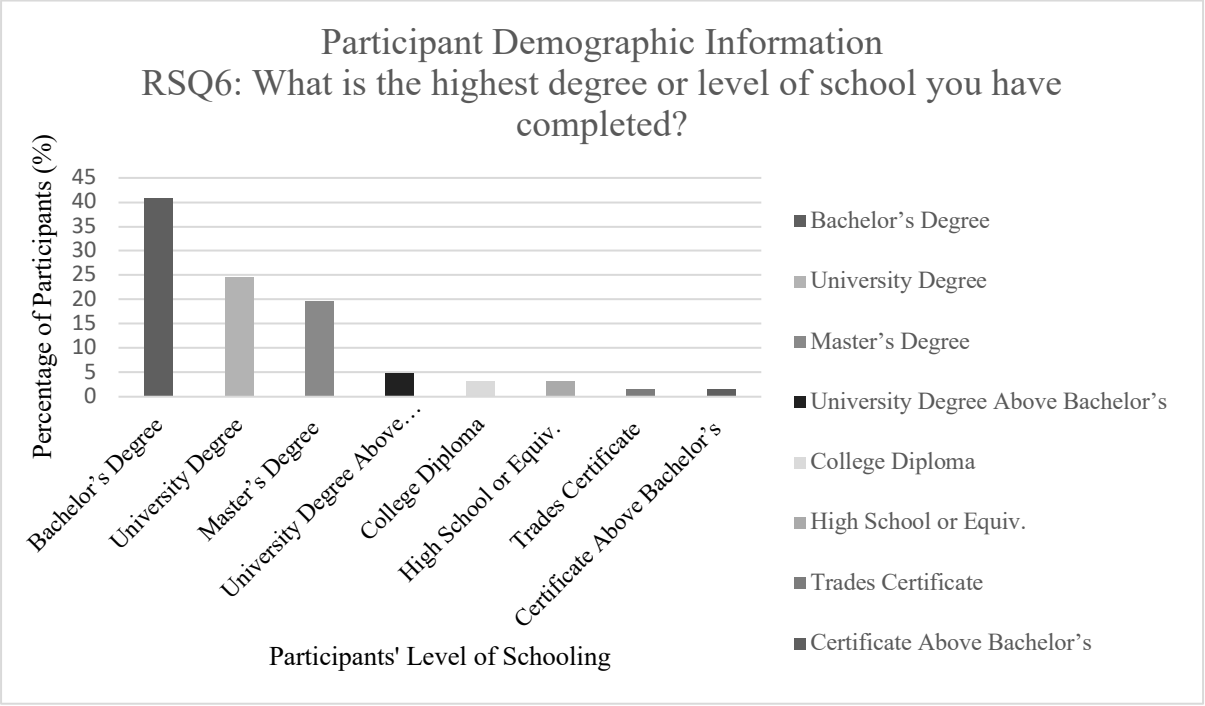

Figure 4.3. Participant demographic information (schooling)

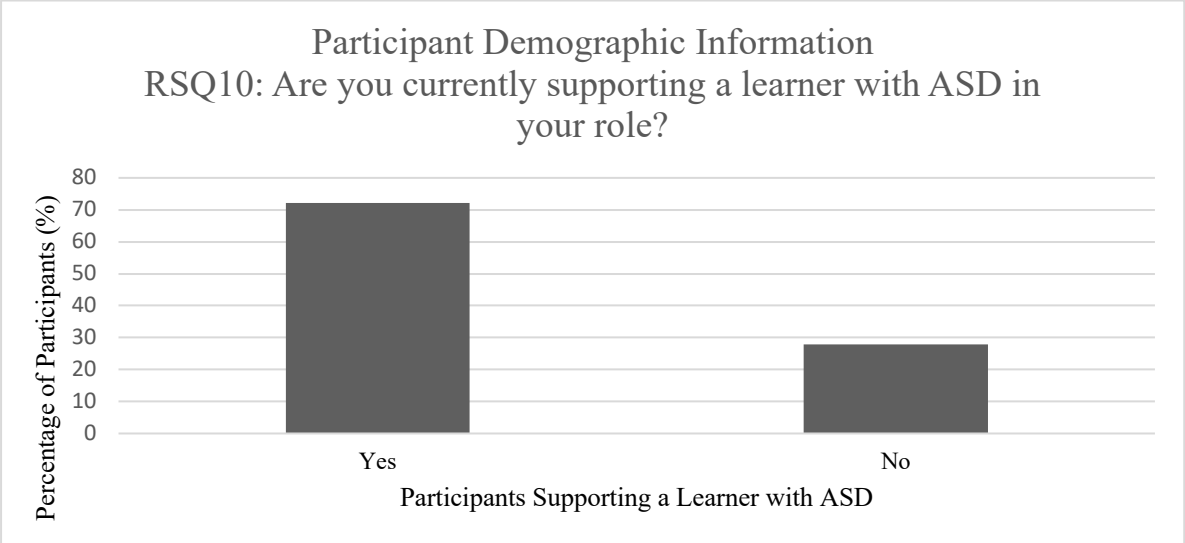

Figure 4.4. Participant demographic information (learner)

Quantitative Results

Quantitative data concerns statistical or numerical data; it involves "measurement and assumes that the phenomena under study can be measured. It sets out to analyze data

for trends and relationships and to verify the measurements made" (Watson, 2015, p. 1). When applying quantitative data analysis, oftentimes, numerical data from a large number of people using research instruments (e.g., surveys) are collected. Following this step, data is typically analyzed using statistical analysis, also described as mathematical analysis in numeric form. Finally, a report is written, whereby a fixed, standard structure of reporting is applied (Creswell, 2012. The module surveys for this project, as they were designed, probe for participants' pre- and post-test attitudes, knowledge, and skillsets surrounding ASD. Thus, they provide the quantitative data necessary to determine the impact of *ASD and Behavioural Interventions* on those who completed the training.

Wilcoxon Signed-Rank Test

In this study, the Wilcoxon Signed-Rank Test was utilized to analyze the quantitative results derived from the pre- and post-test numerical scaled surveys. (See Table 4.2 below). This non-parametric test was chosen due to the abnormal distribution of the data set. The test was applied on each of the corresponding pre- and post-test survey questions, resulting in five sets of output data that were analyzed to determine if significant differences could be seen between each set. The test itself is "based on ranking the differences between scores in the two conditions you're comparing. Once these differences have been ranked, the sign of the difference (positive or negative) is assigned to the rank (Field, 2018, p.298). This allows the researcher to note distinct changes between scores and values. Applying the Wilcoxon Signed-Rank Test was a crucial step in analyzing the quantitative data as it allowed the researcher to pinpoint significant changes in participants' feelings of competency following course completion. Such

feelings surrounded knowledge of ASD in general, and strategies for teaching individuals with ASD.

Prior to beginning the *ASD and Behavioural Interventions* course, participants were asked to complete a set of pre-intervention survey questions. As part of these survey questions, participants were asked to rate their comfort levels around: recognizing the key characteristics that contribute to a diagnosis of ASD; understanding how the characteristics of ASD may impact learning; recognizing some interventions for learners with ASD that are evidence-based and some that are non-evidence-based; supporting learners with ASD in an educational context, and recognizing adaptations and intervention strategies that may help individual learners with ASD.

Following course completion or post-intervention, participants were asked to complete the same set of questions. These module surveys were described by Maich in her 2015 internal review of the program as "module surveys focused on both quantitative elements (timing, learning, and content) with continuous numerical data, rating scales, yes/no, and checklist-type responses, and qualitative elements with multiple opportunities for open-ended comments" (p.10). These survey questions and answers provided the quantitative data for this project. The table below (Table 4.1) describes the means and standard deviations of pre- and post-test self-evaluations of comfort levels (n = 60). It is important to note that the mean response rose each time when comparing the pre-test and post-test responses. This indicates participants' increased perceptions of competency in ASD knowledge and interventions for supporting individuals with ASD in educational settings.

The mean response for the pre-test question SSQ1-1 (recognizing key characteristics of ASD) was 2.85, while the mean response for the corresponding post-test question RSQ13-1 rose to 4.08. The mean response for the pre-test question SSQ1-2 (how characteristics of ASD may impact learning) was 3.15, while the mean response for the corresponding post-test question RSQ13-2 was 4.34. The mean response for the pre-test question SSQ1-3 (recognition of evidence-based and non-evidence-based interventions for individuals with ASD) was 2.74, with the mean response for the corresponding post-test question RSQ13-3 being 4.25. The mean response for the pre-test question SSQ1-4 (supporting learners with ASD in educational contexts) was 2.89, while the corresponding post-test question RSQ13-4 response rose to 4.18. Finally, the question related to SSQ1-5 (adaptations and interventions that may assist learners with ASD) was 2.80, while the corresponding post-test question RSQ13-5 response jumped to 4.19. (See Table 4.1 below).

Table 4.1.

Means and Standard Deviations of Pre- and Post-Test Self-Evaluations of Comfort Levels (n = 60).

	Pre-Test		*Post-Test*	
Question	M	SD	M	SD
Key characteristics	2.85	.872	4.08	.737
Learning impact	3.15	.792	4.34	.629
Evidence base	2.74	.835	4.25	.699
Educational context	2.89	.777	4.18	.695
Strategies	2.80	.755	4.19	.656

$p<0.05$

Below (Table 4.2) are the Wilcoxon-Signed Rank Test results for the pre- and post-test data. This table shows z values (standard score) which describe standard deviations related to the mean, p scores which describe significance, and r scores which measure

strength and direction of relationships (effect size). The *z* scores are positive, indicating that the raw scores are higher than the mean average. The *p* values are all <.001, which means that the results are considered significant. *P* values indicate probability; for example, *P* value scores of zero indicate no likelihood while scores of one indicate absolute certainty. Thus, scores <.01 are statistically significant. The *r* values describe the effect size. An effect size is considered strong if *r* = +/- 0.70. In this case, the *r* values were all greater than +0.70, showing that the effect size was strong and notable. (See Table 4.2).

Table 4.2.

Wilcoxon Signed Ranks Test Results Comparing Pre- and Post-Test Self-Evaluations of Comfort Levels (*n* = 60).

Question	*z*	*p*	*r*
Key characteristics	5.984	<0.05	0.772
Learning impact	6.131	<0.05	0.792
Evidence based	6.334	<0.05	0.818
Educational context	5.958	<0.05	0.769
Strategies	6.229	<0.05	0.804

p<0.05

Qualitative Results

Qualitative data are based on words. Qualitative approaches utilize tools such as open-ended interview questions to capture participants' attitudes and experiences, and are typically reported using flexible, emerging structures that often include researchers' subjective reflexivity and bias (Creswell, 2012). Researchers apply qualitative analysis on a data set by developing codes. These codes are applied to segments of text signify important and/or frequently appearing information within the data. From these codes, researchers are able to identify themes that underlie data which are reported as emergent results from rich, deep data. Developing qualitative themes organizes and describes a data

set minimally but in in rich detail (Braun & Clarke, 2006). However, Braun and Clarke suggest that frequently it goes deeper and further than this, as it interprets aspects of the research topic. Codes assist in providing direction as to where the data is taking a researcher. They help to identify the over-arching themes and messages a dataset conveys. Table 4.3 (below) describes each of the codes applied and their relevance to this particular study.

Table 4.3.

Code Frequency and Description Table

Code	Frequency	Description
Self-Paced	22	The course is set up in a way that participants may complete it on their own time. This was the most frequently applied code.
Videos	11	The course includes many video examples throughout the modules that allow participants to see how specific interventions may be applied in educational contexts.
Enjoyed the Course	9	In RSQ19 participants were asked if there was anything else, they'd like developers to know about their experience with *ASD & BI.* This code indicates reoccurring responses that indicated positive experiences with the course that were unspecific or general.
Flexibility	8	Many participants remarked that positive aspects of the course included being able to work through the content at an individualized pace, in their own time. Additionally, participants reported appreciating the digital aspect of *ASD & BI* in being able to work anywhere in which internet access is available.
Practicality	8	Participants often noted that the course is very practical in terms of providing real-life examples and scenarios and interventions that they could see themselves applying in "real life" contexts.

Examples	6	The course is equipped with numerous examples (in the form of video (shot in educational settings with real students and professionals) as well as written explanations. Participants frequently stated that the examples were a positive aspect of the course.
Token Economy	6	Token economy is one of the evidence-based interventions taught throughout the course. It reported to be one of the most highly applied interventions by participants with their own students following the course. The token economy intervention follows the pretense that students work towards specific rewards (rewards make be physical objects or opportunities to engage in a preferred activity).
Visual Aids	6	Using visual aids are another evidence-based intervention for individuals with ASD that is taught during the course. In addition to the token economy, it was the most highly reported intervention applied by participants with their own students following the course. Visual aids have been proven to be effective strategies in supporting individuals with ASD. This is because individuals with ASD experience challenges in communication (oral and body language in particular). In educational contexts, visual aids are picture cues that are implemented within daily routines to assist in conveying what is expected of a student with ASD, specifically and explicitly. Individuals with ASD may also utilize visual aids to communicate themselves and convey their own desires when language itself poses a challenge.
User-Friendly	6	Participants reported that an effective aspect of the course was how user-friendly it is. In this context, this code refers to ease of access to the course shell and additional course resources. In other words, participants did not find it difficult to access the course material and did so with relative ease.
Practice Assessments	5	The post-module practice assessments were reported as effective aspects of the course by a good few participants. Participants said that they enjoyed the unlimited retries and the fact that they could take as much time as they needed to complete them, allowing for deeper learning experiences.

Length of Modules	4	Four participants noted that perhaps some modules may be shortened in the future to avoid repetition.
Resources	4	When participants mentioned course resources (such as video and website links) this code was applied. In this context, excerpts coded "resources" discuss resources contained within the course that participants deemed effective.
Not Printer-Friendly	3	A few participants mentioned experiencing technical difficulty when trying to print module content. In such cases, this code was applied.
Broken Links	3	A few participants mentioned experiencing technical difficulty when trying to access certain website links provided within the course. In such cases, this code was applied.
Discussion Board	2	Two participants noted that a discussion board or forum may improve the course overall. Although only coded twice it stands as a significant suggestion towards course format.
ABC Charts	2	ABC charts are an evidence-based intervention taught within the course. Two participants mentioned applying this intervention following the course. Although only coded twice, this is a significant code as it refers to an EBI. ABC charts are anecdotal tools that professionals may use to track behaviour and conduct a form of functional behaviour assessment (FBA) to determine the antecedent (behaviour trigger), the behaviour itself, and the consequence of the specific behaviour (and whether this consequence is positive or negative). These charts help professionals who work with individuals with ASD determine the trigger(s) and function(s) of specific behaviours. This helps to remediate undesired behaviours.

Peer-Mediated Interventions	2	Peer-mediated intervention (PMT) is an evidence-based strategy that two participants reported applying in their own educational settings following course completion. Although only coded twice, this is a significant code as it refers to an EBI. PMT is a strategy in which appropriate or desired behaviour is modelled by a peer. The individual with ASD works alongside the peer and hopefully begins to model the desired behaviours.
Positive Reinforcement	2	Two participants mentioned applying positive reinforcement as an intervention technique following the course. While only appearing twice in the data, it stands as significant as it is an intervention strategy that was applied post-course. Positive reinforcement can take the form of praise and/or rewards.
Content for Older Students	2	Two participants reported that including more content targeted toward older (specifically junior high/high school students) would improve the course overall.
Visuals	1	This code refers to a participant reporting "charts and visuals" (in demonstration and teaching of interventions) as an effective aspect of the course. While the code "visual aids" refers to the EBI.
Download a Copy	1	One participant mentioned that being able to download a copy of the training program at the end would improve the course. While only mentioned once, it stands as a significant piece of information as it is a suggestion towards improvement.
Evidence-Based Practices	1	When a participant mentioned the phrase "evidence-based practice" (or evidence-based intervention) this code was applied. Although the general term was only utilized once in the short answer responses, it remains, as EBIs remain at the core of the training program. EBIs are interventions/strategies that have been proven effective through scientific research studies.

Peer-Sensitivity Training	1	Another evidence-based intervention only reported to be applied post-course once. However, it remains significant as one of the main goals of the course is to introduce participants to EBIs and have them apply them in their own contexts. Peer-Sensitivity Training is when students are educated around acceptance and sensitivity towards differences among people. This intervention may be a helpful step in ensuring students with ASD feel welcomed and included within their peer group.
Social-Skills Training	1	Another evidence-based intervention only reported to be applied post-course once. However, it remains significant as one of the main goals of the course is to introduce participants to EBIs and have them apply them in their own contexts. Social skills training refers to explicit instruction of appropriate social responses and behaviours. These skills are usually practiced with and modelled by peers as well as educational professionals who support learners with ASD.

Figure 4.5 depicts how often each particular code was assigned within the dataset. It is color-coded and indicates the frequency of application per code. Figure 4.6 describes code application frequency as well, however, the codes have been illustrated using a "word cloud" which indicates all of the codes with the more frequently applied codes appearing bigger in the cloud. (See Figures 4.5 and 4.6 below).

Media	Broken Website Links	Discussion Board	Download a Copy	EBPs	Enjoyed the Course	Examples	Flexibility	Length of Modules	More Content for Supporting Older	Not Printer-Friendly	Peer Sensitivity Training	Practicality	Practice Questions and	Resources	Self-Paced	Social Skills Training	Use of ABC Charts in Classroom	Use of Choice in the Classroom	Use of Peer-Mediated Intervention in	Use of Positive Reinforcement in	Use of Token Economy in	Use of Visual-Aids in Classroom	User-Friendly	Videos	Visuals	Totals
Qualitative Post-Test Data	2	2	1	1	9	6	8	4	2	3	1	8	5	4	22	1	2	1	2	2	6	6	6	11	1	116
Totals	2	2	1	1	9	6	8	4	2	3	1	8	5	4	22	1	2	1	2	2	6	6	6	11	1	

Figure 4.5. Code applications

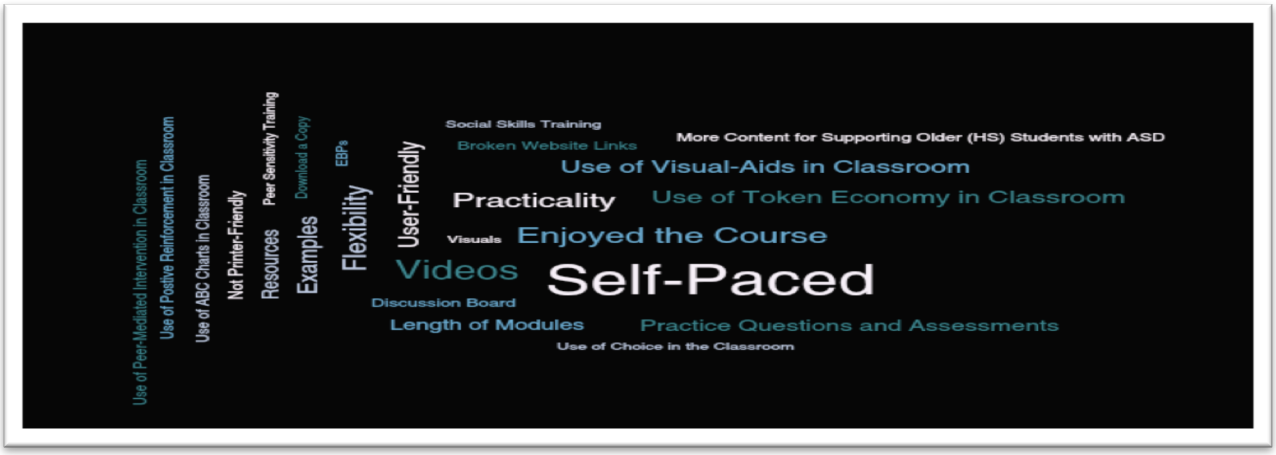

Figure 4.6. Code application word cloud

The qualitative data findings within this study complement the quantitative findings. Braun and Clarke (2006) note, "through its theoretical freedom, thematic analysis provides a flexible and useful research tool, which can potentially provide a rich and detailed, yet complex, account of data" (p.78). Such analysis allows for a more substantial evaluation of the course at hand. The entire goal and purpose of this kind of research is to provide a rich understanding of a topic of phenomena (Florczak, 2017).

These qualitative results allow for a deeper understanding, and ultimately, a more in-depth evaluation of the course undertaken by participants.

Themes

The development and analysis of themes are critical aspects of qualitative research, as themes serve to guide researcher towards conclusions emerging from data. During thematic analysis, the researcher scours data such as transcripts of interviews or focus groups repeatedly in order to detect patterns of meaning that appear repeatedly across the data (Braun & Clarke, 2006). In this research, an online software program was utilized (*Dedoose*) to assist in thematic analysis of the data. This software helps researchers to pinpoint and organize emerging themes, which are: "something important about the data in relation to the research question and represents some level of patterned response or meaning within the data set" (Braun & Clarke, 2006, p.82). Following thematic analysis, seven themes emerge that serve to provide additional information and attribute to the evaluation of *ASD and Behavioural Interventions*. Participants were anonymized using pseudonyms.

Self-paced adult online learning allows flexibility. The most highly reported (*n* = 22) positive aspect of participants' learning experiences during *ASD and Behavioural Interventions* was the ability to complete the course in a self-paced manner and the flexibility that coincided with that. Many participants enjoyed the fact that the course could be completed on their own time. While the course does have start and finish dates, it does not include specific deadlines for completion of modules or practice assessments. In her 2015 internal review, Maich (2015) explained:

> A total time allocation of 40 hours is expected for the entire training. Suggested timelines or benchmarks for completion of sections of the training are provided to help keep participants on track in the welcome message and the home page, and emailed reminders are sent if participants appear to be getting behind; however, the final completion deadline is the only date to which participants are accountable (p.6).

Participants reacted positively in possessing autonomy over their own learning. Jennifer, for example, stated that, "I liked that I could do it at my own pace—but [I] really appreciated the time-frame suggestions." Another participant, Sarah, noted that the most positive aspect of the online learning experience was the "flexibility to work on the course during times that meet my schedule constraints." The adult learners who completed this training program found this design ideal as it allowed them to balance busy personal schedules whilst completing the training program. In additional to allowing more freedom in terms of time-management, participants reported that the self-paced structure allowed for deeper and more meaningful learning experiences. Nancy said, "…my own pace in my free time, the power to analyze deeper things that I was struggling with and to be able to go a little faster on the parts I already knew." Structuring the course in this way worked well for the adult learners involved. Tullis and Benjamin (2011) conducted a study in which it was determined that individuals who followed a self-paced learning directory outperformed those who did not, consistently. They concurred, that this was because self-paced learners may allocate their learning time in a manner that best suits them (with focus on areas of their own individual need), (p.115). Adults possess the ability to take responsibility over their own learning, and thus, they are able to identify

their own areas of weakness and strength. Utilizing a self-paced approach, especially in adult online learning, helped to facilitate these experiences.

Ease of access is important. Another aspect of the course that was reported as being quite positive was ease of access. Six participants reported that the course was user-friendly and uncomplicated to navigate. Rose said:

> The course was learner friendly. I had no problems navigating any of the modules. I found the content easy to understand and the information applicable to my daily work situations. The video examples were well done and demonstrated what was being taught. Overall, I found it to be an enjoyable learning experience.

Ease of access and functionality are critical aspects of online learning, as these aspects allow participants to devote their precious time to learning and understanding the course, not towards navigating the "basics." The basics of a course or program may include: learning how to navigate around a course shell, accessing the website and/or software, working through the modules, or accessing recourses, such as videos and webpage links. Tessa reported having no issues navigating the site and of having a positive experience with the learning assessments (post module completion). She said, "Very easy to navigate the site. Evaluations never took me more than 15 minutes to do. The questions were very clear, and I liked the format (multiple choice)." Kyle appreciated the organization, clarity, and resources provided through the course modules. He said, "I loved the module learning guides! I also love how everything is checked off when you complete it because you know where you left off when you started up the next time. The information was very well written and easy to understand. The examples and videos really helped also!" Ease

of access is critical in adult online learning as it seemed to set the tone for the participants' entire experience with the course.

Practical content with real-life examples allows for more authentic learning experiences. Participants appreciated the practicality of the course and its use real-life examples. The course includes many resources, such video footage of student-teacher interactions. Participants found this characteristic of the course to be highly practical, as they could easily envision how strategies may look within their own teaching practices. Jane said, "The information was very well written and easy to understand. The examples and videos really helped also!" Madonna referred to the course content as "very applicable in the classroom setting" and went on to note that, "it is applicable to more than just students with ASD." Practicality and authentic learning experiences are key, specifically in online, self-directed, adult learning. The adults who enrolled themselves in this training program had enrolled themselves with a purpose in mind: to acquire additional knowledge of ASD and appropriate supports in educational contexts. Thus, they require that information disseminated through the course is practical and applicable in "real-life" settings, (i.e., the classroom).

Another practical aspect of this training program is its post-module practice assessments. Many participants appreciated the practice assessments with unlimited retries and without time constraints. Each module was complete with a practice quiz at the end, which served as a tool in reviewing and retaining information gathered throughout said module. When asked about the most positive aspects of the course, Cindy stated "being able to rewrite the quizzes and tests until you pass because I believe that's the way you learn best—not with the stress of passing or not." Participants appreciated

that the module quizzes were not intended to be employed as forms of summative assessment, but as formative and self-assessment for each participant. Participants were free to retake each quiz as many times as necessary for them to absorb and retain the knowledge they had been provided in the module.

Evidence-based interventions introduced have been successfully applied in participants' classrooms. It is important to note that many of the evidence-based interventions introduced during the course were reported as successfully utilized within participants' classrooms. These techniques include the token economy, visual aids, and positive reinforcement. EBIs and supports were the core foundation of the behavioural interventions highlighted in *ASD & BI.*

The token economy strategy was utilized most often (n = 6), according to participants' responses. Yvonne reported that she had been "using ideas from the token economy/what are you working for" following training through *ASD & BI*. Mirzamani, Ashoori, and Sereshki (2011) describe this EBI, stating, "token economy reinforcements can be a piece of paper, stars, chips, nuts (metal, wood or plastic) which are given to students after they have shown a desirable behaviour; and later, they can exchange it for…favorite reinforcements" (p.26). This EBI allows students to collect tokens as they work towards a desired behaviour or goal.

Another EBI that was reported to be frequently employed following the training program (n = 6) was implementation of visual strategies within learning environments. Chantel said, "I have already started incorporating more visual schedules, and a variety of prompts into my classroom. I like the idea of physical cues (lines in classroom etc.)." Many individuals with ASD often face challenges in understanding verbal

communication, and thus, visual cues provide support as an alternative method of communication, (Meadan, Ostrosky, Triplett, Michna, and Fettig, 2011), (p.29). Michael describes in detail, his use of visual aids in supporting a student with ASD. He states:

> I started working with this child a year ago, I started right away with Requesting, as when I started working with him he had very little speech and would cry for almost anything he wanted. Now he is speaking much more and requests with very little to no prompting. Right now I am working on some task avoidance with less preferred tasks (writing) . During writing time we usually leave the classroom and find a quiet place that is less distracting for him and his peers. I bring some highly preferred reinforces with me, he picks from his choice board what he wants to work for, he has a visual aid that I point to when I see signs of frustration so he can request for help without crying or screaming, we work depending on the day sometimes we write a whole sentence and then reinforced other days it could be 1 - 3 words. When he asks for help with no prompting, he is highly reinforced, with social reinforcement.

Visual aids have been identified as quite effective strategies to employ for all students when establishing positive behaviour supports (PBI) and can prove particularly useful with individuals on the autism spectrum.

Two participants also reported applying various positive reinforcement techniques (which can range from simple verbal reinforcements and praise, to utilizing token economies and rewards-based systems, and peer-mediated interventions. Jerry mentioned how he utilized the peer-mediated intervention strategy to demonstrate social skills, stating, “[I] identified a lagging skill a student needed, taught the skill: one-to-one, [and]

embedded the skill into a classroom routine to address a challenging behaviour." This EBI can not only be used as a method of teaching specific skill sets to students with ASD, but also as a way of encouraging and facilitating interactions between the student with ASD and his peers in an inclusive setting.

Improvement is possible. While many positive characteristics of the course were described, there is definitely room for improvement. Some participants experienced technical difficulties, which can pose challenges within online learning environments. Such challenges included, videos lagging, broken links, and the course material not being printer friendly. As a suggestion towards the overall content of the course, Beth suggested to "provide access to the printer-friendly module content pdf file at the beginning of the module." She mentioned that, "it is hard on the eyes to read from the screen, [and that] many pages were not printer-friendly and were cut off along the margins." Tina stated that "the videos lagged so I had to pause them in order to view them" and John suggested to "double check some of the links (resources) as they are no longer available." Additionally, some participants mentioned that certain modules may be excessively long and noted the need for more examples that included high school students and teachers. These recommendations for improvement should be taken into account when redeveloping the course for future implementation.

Summary

The pre- and post-test survey responses (both quantitative and qualitative) provided critical and influential information to this external review of *ASD & BI*. Through quantitative data analysis it was found that all pre- and post-test response comparisons yielded statistically significant results. In addition to the quantitative piece, the qualitative

data presented a number of themes which allow the reader to view the course through the lenses of participant.

Responses referring to evidence-based practices and interventions comprised a great deal of both the quantitative and qualitative data pieces. The quantitative data indicates the evidence-based practice questions yielded post-test responses that were most significantly above the mean. EBIs were found to be an overarching theme within the qualitative data. Truly, they make up the core of the behavioural interventions introduced in *ASD & BI* and the need for educational professionals to possess knowledge of accredited and proven to work interventions cannot be left understated. In the next chapter EBIs and conclusions that have been drawn from the results will be discussed in further detail.

Chapter Five: Discussion

This chapter first provides a brief summary of results. Next, it provides a discussion surrounding the perceived effectiveness of *ASD and Behavioural Interventions: An Introduction for School Personnel*, areas of strength and need, and recommendations towards subsequent developments of the course. The study will serve as an external evaluation of *ASD & BI.*

A mixed methods approach to the research design was chosen for this review. Halcomb and Hickman (2015) describe the genre, noting that "mixed methods research involves the use of qualitative and quantitative data in a single research project. It represents an alternative methodological approach, combining qualitative and quantitative research approaches…" (p.41). This style accounts for a more comprehensive understanding of the course. This study employed an integration of methods rather than a mixing. Glogowska (2011) describes this approach, stating, "integration is where different methods keep what makes them different at the paradigm level but are be interlinked with each other, to produce a fuller account of a phenomenon" (p.256). The quantitative pre- and post-test surveys integrated with the qualitative post-test short answer questions allowed a more thorough understanding of how participants perceived the to be revealed.

The research questions for this study were as follows: How effective *is ASD and Behavioural Interventions: An Introduction for School Personnel* perceived to be? What did participants perceive to work with *ASD & BI*? What didn't participants perceive to work with *ASD & BI*? What is the typical demographic that took the *ASD & BI* course? Chapter Four presented five themes that emerged through the qualitative data as well as

results derived from the quantitative data. Chapter Five has explored and expanded upon salient results presented within chapter four.

The quantitative data were derived from the pre- and post-test survey questions embedded within the course. This data provided the researcher with information pertaining to participant demographics, as well as pre- and post-test comfort levels towards ASD and knowledge of evidence-based educational intervention strategies. The quantitative results help to answer the following research questions: What is the typical participant demographic that enrolled in the *ASD & BI* course? And, how effective *is ASD & BI* perceived to be?

The qualitative data was extracted from post-course short answer questions and answers, analyzed through the online qualitative analysis software, Dedoose. The qualitative results provided detailed participant accounts and experiences with the program, and suggestions for future direction. The qualitative results help to answer many of the research questions, including: How effective is *ASD & BI* perceived to be? What did participants perceive to work with *ASD & BI*? What didn't participants perceive to work with *ASD & BI*?

Participant Demographics

Sixty participants were included in this study. Of course, the participants were quite similar in many ways, as they were all school personnel, presumably eager to expand their knowledge of ASD and appropriate interventions. The specific participant demographics displayed in Chapter Four indicate that the vast majority of participants were female (n = 55) in comparison to male (n = 5), (with one participant choosing not to indicate gender). Most were subject teachers (n = 32), educational support teachers (n =

13) or other (n = 9). Other refers to supply teachers, educational assistants, “complex case” teachers, counsellors, subject teachers on educational leave, education support teachers, and integrated services (francophone only). Many participants possessed a bachelor’s degree (n = 25), a university degree (n = 15) or master’s degree (n = 12). Additionally, more (n = 44) participants were supporting a learner with ASD as they completed the course than not (n = 17).

This information tells us that the typical participant demographic that chooses to enroll in *ASD & BI* appears to be a population of highly educated (generally female) educational professionals (i.e., subject teachers, educational support teachers, educational assistants, counsellors, “complex case” teachers, and integrated services teachers) who are supporting a learner with ASD at the time of course enrollment. The individuals who choose to enroll in *ASD & BI* typically have a purpose for doing so. They are typically already teaching in an educational setting, supporting learners with ASD and have obtained notable higher education but still feel under-trained in the area of ASD. Ravet (2018) notes that when teachers, especially early and beginning teachers, possess a lack of knowledge and understanding, it can hinder motivation and self-efficacy which makes them less likely to accept responsibility to appropriately seek out intervention practices for their learners. Too often this is the case. The participants who chose to enroll in this study go against this narrative as they attempt to regain knowledge and power over their own pedagogy and subsequently, their learners.

Educational professionals may also seek enrollment in ASD & BI to increase their desirability as an employee. Educational professionals receive little, if any, training on evidence-based interventions (EBIs) for individuals with ASD (National Research

Council, 2001). Due to this lack of training, teachers who possess expertise in applied behaviour analysis and related EBIs will remain in demand as the prevalence rates of ASD increase and inclusion models are facilitated (U.S. Department of Education, 2002). Having obtained some training in this area provides educational professionals with skillsets that give them an edge in competitive job fields.

A Significant Difference

The Wilcoxon Signed-Rank statistical test served as a tool in analyzing the quantitative pre- and post-test data. The Wilcoxon Signed-Rank is a non-parametric test utilized in situations where "data are obtained two times when pre and post treatment measures are taken from same subjects. In such designs, pre-treatment measurements are generally accepted as control values, these designs [are] called pre-post design, paired design or self-controlled design" and seek to compare data sets before and after some event or intervention (Ankarali, Yilmaz, & Aydin, 2012, p.56). The goal was to determine if, and by how much, the mean ranks would differ when comparing pre- and post-test data. The Wilcoxon Signed-Rank analyzed participants responses to five survey questions repeated on both the pre- and post-test. These questions referred to characteristics of ASD, the impact ASD has on learning, evidence-based interventions, supporting learners with ASD, and appropriate adaptations and interventions.

The Wilcoxon Signed-Rank demonstrated that statistically significant mean differences could be found when comparing each set of pre and post test data. A test is significant if $p<0.05$. In this case, all five sets of output data had significance levels where $p<0.001$. These data demonstrate that there was a strong effect size. According to these

results, there is a likelihood that completion of *ASD & BI* contributed to the changes in attitude and perceived competency.

The quantitative pre- and post-test surveys employed within this study tell us that the course could be perceived as quite effective. The purpose of *ASD & BI* is to increase educational professionals' knowledge of ASD and comfort in supporting such learners whilst employing evidence-based intervention techniques. The results show that the course has likely assisted in increasing participants' knowledge of characteristics of ASD, how such characteristics may impact learning, in recognizing interventions that are evidence based versus non-evidence based, appropriate methods of support for leaners with ASD, and effective intervention and adaptation techniques.

From the qualitative data five major themes emerged. The most critical information brought forward through these themes surround the ideal qualities of online learning environments for adults and the importance of evidence-based interventions in ensuring effective support of individuals with ASD in educational settings.

Ideal Qualities of Adult Online Learning Environments

The most frequently mentioned characteristic of *ASD & BI* that participants perceived to work well was that learners can work on the course at their own pace. The most typical challenges individuals completing online courses face surround time issues, format and content, course difficulty, and goals and expectations (Kizilcec & Halawa, 2015). Time issues may pose an even greater challenge for adult learners who are oftentimes working and balancing many other responsibilities and roles in addition to that of a student. Kizilcec (2017) notes that within self-paced, or self-regulated online learning environments "the lack of pressure in this non-traditional environment emerged as

another factor influencing persistence, which relates to task management strategies, such as effort regulation" (p.20). Learners in self-paced learning environments often feel less pressured surrounding timelines and competition of specific tasks. They feel a greater sense of flexibility and oftentimes, greater independence over their own learning. This in turn, increases motivation and effort. It is however important to note that individuals who choose to enroll in self-regulated programs such as *ASD & BI* must already possess a high degree of time management and self-efficacy skillsets, and the motivation to complete tasks without prompting. Kizilcec (2017) states:

> In the absence of support and guidance from an instructor, the ability to regulate one's learning process is a critical skill to achieve personal learning objectives. Unlike in school settings, where time is typically structured around classes and everyone follows a fixed schedule, online learners need to determine when and how to engage with course content of their own accord (p.19).

Participants who choose to enroll in *ASD & BI* are typically highly motivated individuals with much experience managing their own time and accepting responsibility over their individual learning. This is likely why participants found the self-paced aspect of *ASD & BI* to be positive and beneficial.

Many participants also reported a high degree of contentment with video examples embedded within *ASD & BI*. It is critical that an online learning environment include abundant, explicit, and practical examples to assist learners in understanding course material. Online learners are not physically present in a classroom with an instructor who may provide demonstrations, thus, video examples serve a very important purpose in a course such as *ASD & BI.* Research supports that observing another

individual perform a task assists the observer in understanding how to perform the same task. This is called observational learning. Educational professionals that enroll in *ASD & BI* are looking to increase their knowledge of evidence-based interventions to apply with students with autism with whom they presently or may one day work to support. It is one thing to read about and study EBIs for individuals with ASD, however, observing another educational professional employ such EBIs in real-life contexts, is often much more beneficial. Bandura (1986) describes observational learning as a method in which learners actively seek to understand the actions of another human through observation, in such a way, the learner constructs a cognitive representation of the behaviour that is being modeled and integrates this with their own prior knowledge. Human beings have been utilizing this observational learning technique since the stone-age and it remains a critical component in learning. When participants of ASD & BI can observe others employing EBIs that they wish to employ and understand, they can more clearly envision applying such interventions in their own educational settings.

Ease of access is another critically important characteristic of an effective adult online learning environment. Learners that experience difficulty and frustrating in accessing components of an online course may become discouraged and unmotivated. This holds especially true for adult online learners who may be juggling many tasks at once, may be completely new to online learning or less knowledgeable of current online learning models, and have to find the incentive to complete the course without the encouragement of an instructor.

Participants of *ASD & BI* considered the course to be quite easily accessible. Ease of access was one of the most frequency appearing characteristics of the course that

participants discussed when asked what they perceived to work well. This may be because when online learners have to dedicate more time than necessary in order to access the basics of a course (such as the course shell, required resources, expectations, etc.,) they may feel discouraged and as if they have little control over their learning. Drennan, Kennedy, and Pisarski (2005) explain, stating, "perhaps individuals who have an external locus of control have a reduced interest in information because they consider that the cost of information searching is not balanced by the benefit gained from that information" (p.333). The typical demographic of learners who enroll in *ASD & BI* are busy working professionals that are seeking additional knowledge and skillsets of which can be practically applied in their own setting. Thus, it is critical that a course such as *ASD & BI* is easily accessible and straight-forward in organization.

Evidence-Based Interventions

One of the main purposes of *ASD & BI* is to ensure that educational professionals who support individuals with ASD are applying evidence-based interventions in their teaching and support. Evidence-based refers to interventions and pedagogical practice that is supported by research (SBR). Mesibov and Shea (2011) describe the benefits of employing such scientifically supported interventions with individuals with ASD, they state:

> There are several clear benefits of an evidence-based (i.e. empirical) approach to autism treatment. First, many years ago empiricism put an end to psychodynamic speculations about parental pathology as the cause of autism. Second, empiricism continues to enable the field to move beyond testimonials and anecdotes from family members, which in autism have resulted in some particularly egregious

> fads (e.g., facilitated communication; the administration of secretin; chemical chelation of the blood).Third, empiricism in educational settings can potentially counterbalance factors such as historical traditions, philosophical trends, and political pressures that influence how services for students with autism are organized and delivered (p.119).

Research has assisted in putting to rest many wrong assumptions towards ASD and its causation. Utilizing evidence-based interventions is a common standard that should be the norm for all professionals, and thus, it should create more fair and equal methods of support. In addition, when professionals employ strategies that are not supported by research, oftentimes the effects on the student are non-existent. In the worst case, negative effects can be noted. It should be considered a waste of precious time to utilize interventions that are not supported by research, as the professional does not know for certain the strategy will produce desirable effects.

ASD & BI teaches participants a variety of EBIs in which they may employ in their own educational contexts. Following completion of the course, participants reported using learned EBIs such as: token economy, visual aids, ABC charts, peer-mediatised interventions, peer-sensitivity and social skills training. This is important because all educational professionals should be using research-based interventions to support their learners for the reasons discussed above. However, professionals may simply lack knowledge of which interventions are supported by research and which are not. *ASD & BI* helps people distinguish between appropriate and inappropriate interventions.

Recommendations

Through this study, recommendations for future implementation of *ASD & BI* have developed. This external review aims to provide an evaluation of course effectiveness and quality and should provide stakeholders direction in terms of reflection as it highlights both the strengths and needs of the program. Through dissemination of the current review improvements to *ASD & BI* can be made which may yield many benefits, such as: increased educational quality of the program, greater enrollment, and most importantly, educational professionals who feel competent in their knowledge of ASD and appropriate interventions. Four recommendations follow. They are:

1. Course stakeholders should comb the course to pinpoint any areas which may cause users technical difficulties. Such areas include videos that lag and broken website links.
2. Course stakeholders should consider providing access to a "printer friendly" version of the course at the beginning of the program. Some users may prefer to utilize both a hard copy in addition to the digital content provided through the course and printing modules individually caused some difficulty for certain participants (i.e., pages cutting off along the margins).
3. Course stakeholders should consider the length of the course and ensure that content is non-repetitive and generally specific and to the point. Some participants mentioned that certain modules covered some of the same topics and perhaps could be made more concise.
4. Course stakeholders should consider including more examples of educational professionals and students in junior high and high school settings. Some

participants mentioned that many of the examples included younger (primary and elementary) students and professionals and they would have liked to see older students in the examples as well.

Summary of Results

The results from this study offer some insight towards participant perceived competencies of *ASD & BI* and have provided answers in relation to the research questions that underpin it. Stakeholders may be interested in these results as they may provide direction in terms of course direction and development.

The demographic of *ASD & BI* participants from this study include a range of educational professionals (predominantly female), most of whom are highly educated subject or educational support teachers who are working full time and supporting a learner with ASD at the time of course completion. This is important for stakeholders to know in planning additional implementation of the program as they now have a clearer picture of their average participant. Stakeholders should also know that the participants included within this study perceived *ASD & BI* to be generally effective overall. This is evident in the significant differences between the mean responses while comparing the pre- and post-test data and the positive remarks that appeared in the qualitative short answer questions. This information may indicate that continuous implementation of the course is appropriate at this point in time.

Educational professionals who seek to increase their knowledge and understanding of ASD and appropriate interventions could be encouraged to enroll in *ASD & BI.* This external evaluation has determined that many elements of *ASD & BI* are effective in the eyes of participants. Participants indicated that they enjoyed the self-

paced schedule, the flexibility and practicality, the video examples, and ease of access to the course.

Some suggested areas of improvement refer to technical aspects (i.e., broken links and slides that were not completely printer-friendly), the length of certain modules and a greater inclusion of information about older students. The results of this study may serve as a means of improving upon the training program and may be taken into consideration in future disseminations of the course.

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Appendix A: Participant Recruitment Letter

Recruitment Script

My name is Dr. Kimberly Maich, and I am an Assistant Professor in the Faculty of Education at Memorial University of Newfoundland. I am conducting a research project called Building Professional Capacity around Autism Spectrum Disorder in New Brunswick's Schools: An Evaluation of the "ASD and Behavioural Interventions" Online Training Program.

The purpose of the study is to conduct a program evaluation of the provincial implementation of New Brunswick's "ASD & Behavioural Interventions: An Introduction for School Personnel" in order to assess its impact and effectiveness.

I am contacting you to invite you to allow the data from your course surveys to be used for a research project. Since you are already completing a survey as part of your course, you need no additional time other than to read the informed consent form, respond to the request to use your survey responses for research purposes, and complete the additional survey questions. In total, this should take no longer than 15 minutes.

If you are interested in participating in this study, please read the Informed Consent form on the next screen and follow the directions. You will also have an opportunity to opt out of the study on the next screen.

If you have any questions about me, or about my project, please contact me by email at kmaich@mun.ca or by phone 1 709 864 4793.

Thank you in advance for considering my request,

Dr. Kimberly Maich

The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research, such as your rights as a participant, you may contact the Chairperson of the ICEHR at icehr.chair@mun.ca or by telephone at 709-864-2861.

Appendix B: Participant Consent Letter

Informed Consent Form

Title:	**Building Professional Capacity around Autism Spectrum Disorder in New Brunswick's Schools: An Evaluation of the "ASD and Behavioural Interventions" Online Training Program**
Researcher:	Dr. Kimberly Maich, MUN, Faculty of Education, kmaich@mun.ca

You are invited to take part in a research project entitled "Building Professional Capacity around Autism Spectrum Disorder in New Brunswick's Schools: An Evaluation of the 'ASD and Behavioural Interventions' Online Training Program."

This form is part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. It also describes your right to withdraw from the study. In order to decide whether you wish to participate in this research study, you should understand enough about its risks and benefits to be able to make an informed decision. This is the informed consent process. Take time to read this carefully and to understand the information given to you. Please contact the researcher, Dr. Kimberly Maich, if you have any questions about the study or would like more information before you consent.

It is entirely up to you to decide whether to take part in this research. If you choose not to take part in this research or if you decide to withdraw from the research once it has started, there will be no negative consequences for you, now or in the future.

Introduction:
My name is Dr. Kimberly Maich and I am an Associate Professor in the Faculty of Education at Memorial University.

Purpose of Study:
The purpose of the study is to conduct a program evaluation of the provincial implementation of New Brunswick's ASD & Behavioural Interventions: An Introduction for School Personnel in order to assess its impact and effectiveness.

What You Will Do in this Study:
As part of the course, you will complete a survey to report on its impact and effectiveness. For this study, you will be asked to answer additional survey questions and to allow your survey to be used for research purposes. Your results will be combined with the results from many others and reported at educational conferences and used to help develop research articles.

Length of Time:
Since you are already completing a survey as part of your course, you need no additional time other than to read the informed consent form, respond to the request to use your survey responses for research purposes, and complete the additional survey questions. This should take no longer than 15 minutes.

Compensation:
To thank you for your participation, you will be asked to share your name and email address with your course facilitator (separately from the survey—it will not be linked with your survey responses) to be entered into a draw for a free registration for the Autism in Education Symposium (Halifax, Nova Scotia, May 2018) as well as draw for a package of professional books. These items are valued at approximately $200 each.

Withdrawal from the Study:
If you decide that you do not want your data used for research purposes, you may withdraw your data any time up until your data are anonymized. This will happen on approximately March 16, 2018. You can withdraw your data by emailing your course facilitator. Your data will then be removed from the set of data used for research purposes until it is impossible to do so (after March 16, 2018).

Possible Benefits:
Potential benefits from participating in this study:

a) Providing information to make your courses even better in the future in order to better teach and support students with Autism Spectrum Disorder.
b) Supporting knowledge about the effective development and delivery of online courses in education.

Possible Risks:
There are no risks for participating in this study beyond what you would encounter in everyday situations.

Confidentiality:
Your data will be kept confidential in this research project. Your responses are one of many; all responses will be grouped together for reporting (aggregated) at conferences and in publications. Your identify, personal information, and data are safeguarded from unauthorized access, use, or disclosure as these data will be anonymized prior to being used for research purposes. If a quotation from your data is used, you will be given a number or pseudonym.

Anonymity:
Although your participation in this survey is not anonymous just as you are not anonymous in your course, your data will be anonymized for research purposes. In other words, your identity will not be shared and your name will be removed from your data. Every reasonable effort will be made to ensure your anonymity. Your name will not be identified in publications without your explicit permission.

Use, Access, Ownership, and Storage of Data:
For the purposes of this research study:

- Your electronic data will be stored on a computer using two levels of passwords for access.
- These research data will only be accessed by the project researchers and research assistant assigned to this project.
- Data will be kept for a minimum of five years, as required by Memorial University's policy on Integrity in Scholarly Research.
- This archived data may be utilized for future follow-up studies, such as a multi-provincial study; however, these data will be fully anonymized and your name will not be associated with it.

Third-Party Data Collection and/or Storage:

Data collected from you as part of your participation in this project will be hosted and/or stored electronically by the Desire2Learn Learning Management System and is subject to their privacy policy, and to any relevant laws of the country in which their servers are located. Therefore, anonymity and confidentiality of data may not be guaranteed in the rare instance, for example, that government agencies obtain a court order compelling the provider to grant access to specific data stored on their servers. If you have questions or concerns about how your data will be collected or stored, please contact the researcher and/or visit the provider's website for more information before participating. The privacy and security policy of the third-party hosting data collection and/or storing data can be found at: https://www.d2l.com/legal/privacy

Reporting of Results:
These data will likely be published in conference presentations, an agency report, and journal articles. A summary will be published on the Autism in Education website (aie.apsea.ca) and/or the New Brunswick Education and Early Childhood Development website (http://www2.gnb.ca/content/gnb/en/departments/education.html) and you will be able to access this summary Atlantic ASD Training (http://asdatlantic.ca/) website without contacting researchers.

Researchers will safeguard your identify, personal information, and data from unauthorized access, use, or disclosure. If a quotation from your data is used, you will be given a number or pseudonym; your name will not be used. Your identity will not be shared and your name will be removed from your data. Every reasonable effort will be made to ensure your anonymity. Your name will not be identified in publications without

your explicit permission, and such a request is highly unlikely.

Sharing of Results with Participants:
A summary will be published on the Autism in Education website (aie.apsea.ca) and/or the New Brunswick Education and Early Childhood Development website (http://www2.gnb.ca/content/gnb/en/departments/education.html) and you will be able to access this summary Atlantic ASD Training (http://asdatlantic.ca/) website without contacting researchers. In addition, you can contact researchers for a copy of any poster presentations that are developed.

Questions:
You are welcome to ask questions before, during, or after your participation in this research. If you would like more information about this study, please contact: Dr. Kimberly Maich (kmaich@mun.ca).

Ethics Clearance:

The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research, such as the way you have been treated or your rights as a participant, you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at 709-864-2861.

Online Consent Form

Consent:
By completing this form, you agree that:

- You have read the information about the research.
- You have been advised that you may ask questions about this study and receive answers prior to continuing.
- You are satisfied that any questions you had have been addressed.
- You understand what the study is about and what you will be doing.
- You understand that you are free to withdraw participation from the study by closing your browser window or navigating away from this page, without having to give a reason and that doing so will not affect you now or in the future.
- You understand that you are free to refuse participation in this study. If you indicate your refusal, you may still complete all segments of the online course, but your survey data will **not** be included in the study.

Regarding withdrawal after data collection (choose ONE):

- You understand that if you choose to withdraw, you may request that your data be removed from the research study by contacting the researcher before March 16, 2018.

By consenting to participate in this research study, you do not give up your legal rights and do not release the researchers from their professional responsibilities.

Please retain a copy of this consent information for your records. Click here for a downloadable PDF version.

- ☐ **Clicking "I AGREE" below constitutes consent and implies your agreement to the above statements.**
- ☐ **Clicking "I DO NOT AGREE" below indicates that you do not consent to the use of your data in the study. You may continue to take the online training without any impact on your course experience.**

Appendix C: ICEHR Clearance

MEMORIAL UNIVERSITY

Interdisciplinary Committee on
Ethics in Human Research (ICEHR)

St. John's, NL Canada A1C 5S7
Tel: 709 864-2561 icehr@mun.ca
www.mun.ca/research/ethics/humans/icehr

ICEHR Number:	**20181115-ED**
Approval Period:	December 4, 2017 – December 31, 2018
Funding Source:	SSHRC VP Award (**SOUGHT**)
Responsible Faculty:	Dr. Kimberly Maich Faculty of Education
Title of Project:	*Building Professional Capacity around Autism Spectrum Disorder in New Brunswick's Schools: An Evaluation of the "ASD and Behavioural Interventions" Online Training Program*

December 4, 2017

Dr. Kimberly Maich
Faculty of Education
Memorial University of Newfoundland

Dear Dr. Maich:

Thank you for your correspondence of November 21 and December 1, 2017 addressing the issues raised by the Interdisciplinary Committee on Ethics in Human Research (ICEHR) concerning the above-named research project.

ICEHR has re-examined the proposal with the clarification and revisions submitted, and is satisfied that the concerns raised by the Committee have been adequately addressed. In accordance with the *Tri-Council Policy Statement on Ethical Conduct for Research Involving Humans (TCPS2)*, the project has been granted *full ethics clearance* to November 30, 2018. ICEHR approval applies to the ethical acceptability of the research, as per Article 6.3 of the *TCPS2*. Researchers are responsible for adherence to any other relevant university policies and/or funded or non-funded agreements that may be associated with the project. If funding is obtained subsequent to ICEHR approval, you must submit a *Funding and/or Partner Change Request* form must be submitted to ICEHR before this approval can be linked to your award.

If you need to make changes during the project, which may raise ethical concerns, please submit an amendment request with a description of these changes for the Committee's consideration. In addition, the *TCPS2* requires that you submit an annual update to ICEHR before November 30, 2018. If you plan to continue the project, you need to request renewal of your ethics clearance, and include a brief summary on the progress of your research. When the project no longer involves contact with human participants, is completed and/or terminated, you are required to provide the annual update with a final brief summary, and your file will be closed.

Annual updates and amendment requests can be submitted from your Researcher Portal account by clicking the *Applications: Post-Review* link on your Portal homepage.

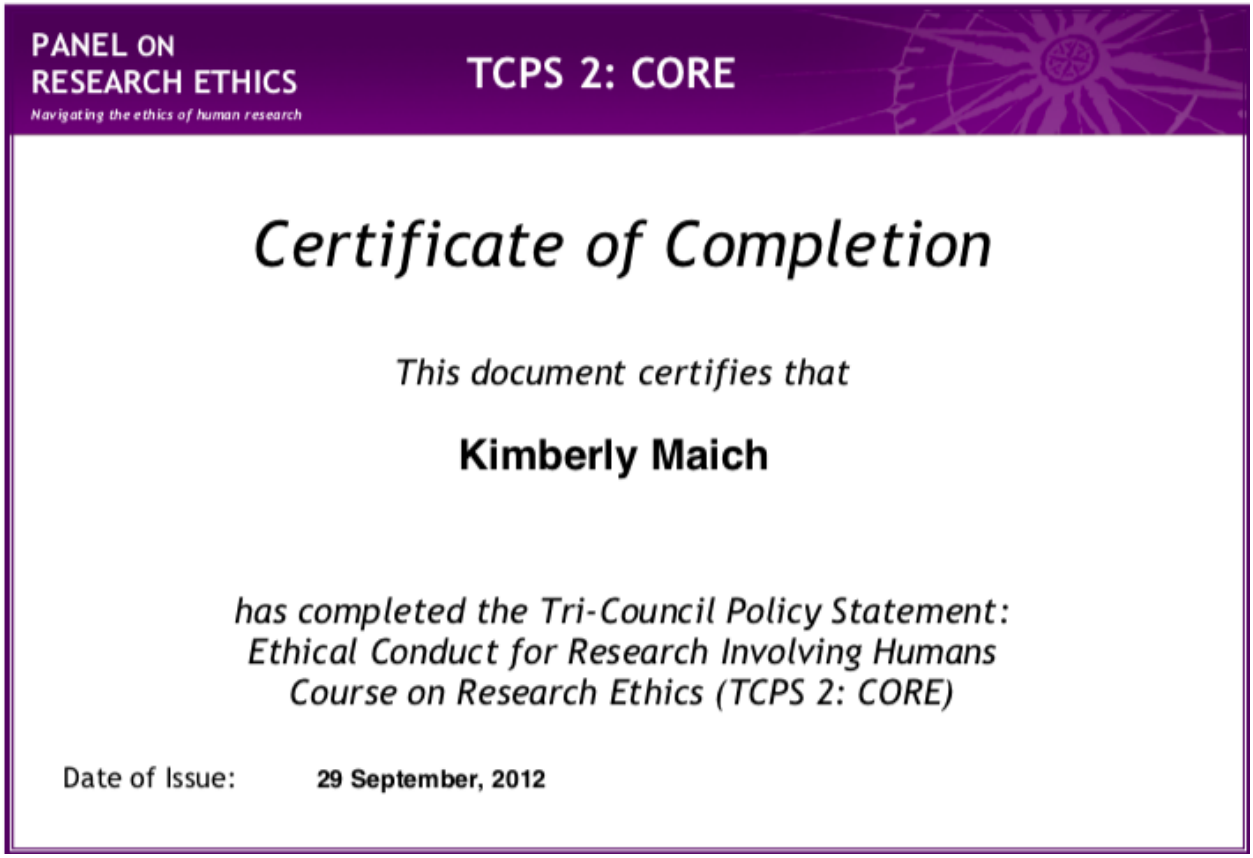
We wish you success with your research.

Yours sincerely,

Kelly Blidook, Ph.D.
Vice-Chair, Interdisciplinary Committee on
Ethics in Human Research

KB/lw
cc: Associate Dean, Graduate Programs, Faculty of Education

Appendix D: TCPS 2:CORE Certification Kimberly Maich



PANEL ON RESEARCH ETHICS
Navigating the ethics of human research

TCPS 2: CORE

Certificate of Completion

This document certifies that

Kimberly Maich

has completed the Tri-Council Policy Statement:
Ethical Conduct for Research Involving Humans
Course on Research Ethics (TCPS 2: CORE)

Date of Issue: **29 September, 2012**

Appendix E: TCPS 2:CORE Certification Chelsea O'Keefe

PANEL ON RESEARCH ETHICS

Navigating the ethics of human research

TCPS 2: CORE

Certificate of Completion

This document certifies that

Chelsea O'Keefe

has completed the Tri-Council Policy Statement:
Ethical Conduct for Research Involving Humans
Course on Research Ethics (TCPS 2: CORE)

Date of Issue: **17 December, 2017**

Appendix F: Exit Module Surveys

Table 2 - *Exit Module Surveys*

Exit M1 **INTRO TO ASD**	Timing	ExitM1_T_Q1	#	Estimate the total number of hours that you spent on this module.
	Learning	ExitM1_L_Q1	Rating	Describe the key characteristics that contribute to a diagnosis of ASD.
		ExitM1_L_Q2	Rating	Recognize examples of how the characteristics may manifest in a variety of learners with ASD.
	Content	ExitM1_C_Q1	Rating	Was clearly written and the level of language used was easily understandable.
		ExitM1_C_Q2	Rating	Was relevant for my work.
		ExitM1_C_Q3	Rating	Videos clearly demonstrated the concept or skill.
	COMMENTS	QUAL	QUAL	Please feel free to comment on any aspect of your overall learning experience so far.
Exit M2 **HOW DOES ASD AFFECT LEARNING?**	Timing	ExitM2_T_Q1	#	Estimate the total number of hours that you spent on this module.
	Learning	ExitM2_L_Q1	Rating	Recognize some of the ways in which learners with ASD are impacted by deficits in cognitive skills, motivation, play skills, observational learning.
		ExitM2_L_Q2	Rating	Recognize the skills needed for group instruction and academics.
	Content	ExitM2_C_Q1	Rating	Was clearly written and the level of language used was easily understandable.
		ExitM2_C_Q2	Rating	Was relevant for my work.
		ExitM2_C_Q3	Rating	Videos clearly demonstrated the concept or skill.
		ExitM2_C_Q4	YN	I found it easy to log in and access the course.
		ExitM2_C_Q5	YN	I have made use of the support of my online facilitator.
		ExitM2_C_Q6	Rating	The course content so far has been interesting and informative.
		ExitM2_C_Q7	Rating	The Learning Guide is helpful to me as I make my notes from the lectures.
		ExitM2_C_Q8	Rating	The Self-Assessment activities help me better understand the content of the modules.
		ExitM2_C_Q9	Checklist	With which kind of device are you accessing the online program content? Check all that apply.
	COMMENTS	QUAL	QUAL	Please feel free to comment on any aspect of your overall learning experience so far.
Exit M3 **EVIDENCE-BASED PRACTICE**	Timing	ExitM3_T_Q1	#	Estimate the total number of hours that you spent on this module.
	Learning	ExitM3_L_Q1	Rating	Define evidence-based intervention.
		ExitM3_L_Q2	Rating	Recognize some interventions for learners with ASD that are evidence based and some that are non-evidence based.
		ExitM3_L_Q3	Rating	Summarize the components of evidence-based practice.
	Content	ExitM3_C_Q1	Rating	Was clearly written and the level of language used was easily understandable.
		ExitM3_C_Q2	Rating	Was relevant for my work.
		ExitM3_C_Q3	Rating	Videos clearly demonstrated the concept or skill.
		ExitM3_C_Q4	YN	Do you intend to implement any strategies that you have learned in this module?
	COMMENTS	QUAL	Open	If you answered YES to the last question, which strategies do you intend to implement?
	COMMENTS	QUAL	Open	Please feel free to comment on any aspect of your overall learning experience so far.

Exit M3	Timing	ExitM4_T_Q1		Estimate the total number of hours that you spent on this module.	
IDENTIFYING LEARNER NEEDS **NOTE: PRO & PARAPRO**	Learning	ExitM4_L_Q1A&B	Rating	PRO ONLY: Recognize the importance of data to evaluating outcomes and select appropriate measurement tools to monitor student progress.	PARAPRO ONLY: Identify the basic steps in the process for developing a summary of a student's strengths and challenges and the importance of the summary to successful program development.
		ExitM4_L_Q2A&B		PRO ONLY: Participate in the process for identifying a student's needs and challenges.	PARAPRO ONLY: Identify formal and informal assessment methods that can be used to develop the learner summary of strengths and challenges.
		ExitM4_L_Q3B			PARAPRO ONLY: Identify the important considerations for prioritizing and establishing learning goals that address identified needs and challenges.
		ExitM4_L_Q4B			PARAPRO ONLY: Recognize the importance of data to evaluating outcomes and select appropriate measurement tools to monitor student progress.
		ExitM4_L_Q5B			Participate in the process for identifying a student's needs and challenges.
	Content	ExitM4_C_Q1	Rating	Was clearly written and the level of language used was easily understandable.	
		ExitM4_C_Q2	Rating	Was relevant for my work.	
		ExitM4_C_Q3	Rating	Videos clearly demonstrated the concept or skill.	
		ExitM4_C_Q4	YN	Do you intend to implement any strategies that you have learned in this module?	
	COMMENTS	QUAL	Open	If you answered YES to the last question, which strategies do you intend to implement?	
	COMMENTS	QUAL	Open	Please feel free to comment on any aspect of your overall learning experience so far.	
Exit M5 **STRUCTURING CLASSROOM ENVIRONMENT**	Timing	ExitM5_T_Q1	#	Estimate the total number of hours that you spent on this module.	
	Learning	ExitM5_L_Q1	Rating	Identify the basic principles of behaviour: antecedent, behaviour and consequence.	
		ExitM5_L_Q2	Rating	Define reinforcement, and differentiate between positive and negative reinforcement, and positive and negative punishment.	
		ExitM5_L_Q3	Rating	Identify the steps for implementing reinforcement to influence motivation and promote learning.	
		ExitM5_L_Q4	Rating	Use observation and a checklist to assess a learner's preferences to identify potential reinforcers.	
		ExitM5_L_Q5	Rating	Identify the steps for implementing a token economy.	

		ExitM5_L_Q6	Rating	Identify a number of antecedent strategies that can be implemented to influence motivation and promote learning for learners with ASD.
	Content	ExitM5_C_Q1	Rating	Was clearly written and the level of language used was easily understandable.
		ExitM5_C_Q2	Rating	Was relevant for my work.
		ExitM5_C_Q3	Rating	Videos clearly demonstrated the concept or skill.
		ExitM5_C_Q4	YN	Do you intend to implement any strategies that you have learned in this module?
	COMMENTS	QUAL	Open	If you answered YES to the last question, which strategies do you intend to implement?
	COMMENTS	QUAL	Open	Please feel free to comment on any aspect of your overall learning experience so far.
Exit M6 **LEARNING PRINCIPLES**	Timing	ExitM6_T_Q1	#	Estimate the total number of hours that you spent on this module.
	Learning	ExitM6_L_Q1	Rating	Identify basic components in the behavioural approach to developing skills – SD/instruction, prompting, response (correct/incorrect), and consequence (reinforcement/ error correction).
		ExitM6_L_Q2	Rating	Identify how to effectively use prompting.
		ExitM6_L_Q3	Rating	Identify instructional approaches commonly used with learners with ASD, including discrete trial instruction, task analysis and chaining, and shaping.
		ExitM6_L_Q4	Rating	Identify key elements for conducting a task analysis.
		ExitM6_L_Q5	Rating	Determine appropriate context for instruction – large group, small group, individualized setting.
		ExitM6_L_Q6	Rating	Identify strategies for embedding goals/outcomes in daily routines.
		ExitM6_L_Q7	Rating	Recognize the importance of and identify strategies for supporting generalization and maintenance of skills.
	Content	ExitM6_C_Q1	Rating	Was clearly written and the level of language used was easily understandable.
		ExitM6_C_Q2	Rating	Was relevant for my work.
		ExitM6_C_Q3	Rating	Videos clearly demonstrated the concept or skill.
		ExitM6_C_Q4	YN	Do you intend to implement any strategies that you have learned in this module?
	COMMENTS	QUAL	Open	If you answered YES to the last question, which strategies do you intend to implement?
	COMMENTS	QUAL	Open	Please feel free to comment on any aspect of your overall learning experience so far.
Exit M7 **CONTINUUM OF TEACHING APPROACHES**	Timing	ExitM7_T_Q1	#	Estimate the total number of hours that you spent on this module.
	Learning	ExitM7_L_Q1	Rating	Recognize the importance of a structured classroom environment to the success of many students with ASD.
		ExitM7_L_Q2	Rating	Identify key considerations for structuring the environment through the use of visual supports, by using work systems, by minimizing distractions and accommodating sensory differences, and by supporting transitions.
		ExitM7_L_Q3	Rating	Identify key considerations for using visual supports and work systems.
	Content	ExitM7_C_Q1	Rating	Was clearly written and the level of language used was easily understandable.
		ExitM7_C_Q2	Rating	Was relevant for my work.
		ExitM7_C_Q3	Rating	Videos clearly demonstrated the concept or skill.
		ExitM7_C_Q4	YN	Do you intend to implement any strategies that you have learned in this module?

	COMMENTS	QUAL	Open	If you answered YES to the last question, which strategies do you intend to implement?
	COMMENTS	QUAL	Open	Please feel free to comment on any aspect of your overall learning experience so far.
Exit M8	Timing	ExitM8_T_Q1	#	Estimate the total number of hours that you spent on this module.
SUPPORTING COMMUNICATION SKILLS	Learning	ExitM8_L_Q1	Rating	Identify the basic functions of communication - requesting, labeling, imitating, intraverbal, and receptive.
		ExitM8_L_Q2	Rating	Identify some of the common characteristics of language and communication in ASD.
		ExitM8_L_Q3	Rating	Identify a number of general strategies that can be used by all school personnel to support language and communication.
		ExitM8_L_Q4	Rating	Recognize the importance of providing communication instruction and practice throughout the day, not just during scheduled intervention periods.
		ExitM8_L_Q5	Rating	Identify the steps for implementing incidental teaching.
		ExitM8_L_Q6	Rating	Identify the steps for pivotal response teaching (NS and PE only). Should this be PE instead of PEI?
		ExitM8_L_Q7	Rating	Identify how transfer trials can be used when teaching new skills and/or as an error correction procedure (PE only).
		ExitM8_L_Q8	Rating	Recognize that alternative and augmentative communication (AAC) includes any form of communication (other than speech) that is used to express thoughts, needs, wants, and ideas.
		ExitM8_L_Q9	Rating	Recognize how AAC systems can be used to support the communication needs of some students.
	Content	ExitM8_C_Q1	Rating	Was clearly written and the level of language used was easily understandable.
		ExitM8_C_Q2	Rating	Was relevant for my work.
		ExitM8_C_Q3	Rating	Videos clearly demonstrated the concept or skill.
		ExitM8_C_Q4	YN	Do you intend to implement any strategies that you have learned in this module?
	COMMENTS	QUAL	Open	If you answered YES to the last question, which strategies do you intend to implement?
	COMMENTS	QUAL	Open	Please feel free to comment on any aspect of your overall learning experience so far.
Exit M9	Timing	ExitM9_T_Q1	#	Estimate the total number of hours that you spent on this module.
ADDRESSING CHALLENGING BEHAVIOUR	Learning	ExitM9_L_Q1	Rating	Identify some proactive strategies that help to support student success and reduce the likelihood that challenging behaviour will occur.
		ExitM9_L_Q2		Recognize that challenging behaviour serves a purpose or function for the individual and identify the main functions of challenging behaviour.
		ExitM9_L_Q3		Identify the steps and key considerations for developing a hypothesis about the function of behaviour.
		ExitM9_L_Q4		Identify potential intervention strategies based on hypothesized function.
		ExitM9_L_Q5		Recognize the importance of documenting and monitoring the interventions implemented to address challenging behaviour.
	Content	ExitM9_C_Q1	Rating	Was clearly written and the level of language used was easily understandable.
		ExitM9_C_Q2	Rating	Was relevant for my work.
		ExitM9_C_Q3	Rating	Videos clearly demonstrated the concept or skill.
		ExitM9_C_Q4	YN	Do you intend to implement any strategies that you have

				learned in this module?
	COMMENTS	QUAL	Open	If you answered YES to the last question, which strategies do you intend to implement?
	COMMENTS	QUAL	Open	Please feel free to comment on any aspect of your overall learning experience so far.
Exit M10	Timing	ExitM10_T_Q1	#	Estimate the total number of hours that you spent on this module.
SUPPORTING SOCIAL SKILLS	Learning	ExitM10_L_Q1	Rating	Identify some of the common social skills difficulties associated with ASD.
		ExitM10_L_Q2	Rating	Identify eight factors that contribute to effective social skills intervention and recognize the importance of a systematic approach to intervention.
		ExitM10_L_Q3		Recognize that social skill difficulties may result from either skill deficits or performance deficits, and identify basic intervention strategies that address each type of deficit.
		ExitM10_L_Q4		Recognize two types of general strategies for social skills instruction, proactive teaching strategies, and strategies for practicing social skills in the natural environment.
		ExitM10_L_Q5		Identify the five basic steps for Behavioural Skills Training (BST), an evidence-based approach for teaching social and functional skills.
		ExitM10_L_Q6		Identify prompting and reinforcement strategies in the natural learning environment.
		ExitM10_L_Q7		Identify the four basic steps for implementing peer-mediated intervention.
		ExitM10_L_Q8		Identify four basic guidelines for peer sensitivity lessons.
	Content	ExitM10_C_Q1	Rating	Was clearly written and the level of language used was easily understandable.
		ExitM10_C_Q2	Rating	Was relevant for my work.
		ExitM10_C_Q3	Rating	Videos clearly demonstrated the concept or skill.
		ExitM10_C_Q4	YN	Do you intend to implement any strategies that you have learned in this module?
	COMMENTS	QUAL	Open	If you answered YES to the last question, which strategies do you intend to implement?
	COMMENTS	QUAL	Open	Please feel free to comment on any aspect of your overall learning experience so far.
FINAL	Content	ExitM_FINAL_C_Q1	Rating	The amount of work in this course was manageable.
		ExitM_FINAL_C_Q2	Rating	The level of difficulty of the quizzes was appropriate.
		ExitM_FINAL_C_Q3	Rating	The online training was user-friendly.
		ExitM_FINAL_C_Q4	Rating	The information presented in this course will help me in my work.
		ExitM_FINAL_C_Q5	Rating	The activities were beneficial in helping me learn the material.
		ExitM_FINAL_C_Q6	Rating	The videos were beneficial in helping me learn the material.
		ExitM_FINAL_C_Q7	Rating	I used the ReadSpeaker function.
		ExitM_FINAL_C_Q8	Rating	I used the Learning Guides as a note-making tool.
		ExitM_FINAL_C_Q9	Rating	I received adequate support with technology issues.
		ExitM_FINAL_C_Q10	Rating	I appreciated having access to a facilitator to respond to questions.
	COMMENTS	QUAL	OPEN	What did you find to be the most positive aspect(s) of your online learning experience?
	COMMENTS	QUAL	OPEN	Have you already implemented a strategy as a result of this training? If so, please tell us which one(s).
	COMMENTS	QUAL	OPEN	Is there anything else you'd like us to know about your learning experience?

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